Foreclosure Delay and U.S. Unemployment

Kyle F. Herkenhoff
University of California, Los Angeles

Lee E. Ohanian
University of California, Los Angeles

Paper presented at the 13th Jacques Polak Annual Research Conference
Hosted by the International Monetary Fund
Washington, DC—November 8–9, 2012

The views expressed in this paper are those of the author(s) only, and the presence of them, or of links to them, on the IMF website does not imply that the IMF, its Executive Board, or its management endorses or shares the views expressed in the paper.
Foreclosure Delay and US Unemployment

Kyle Herkenhoff and Lee Ohanian

UCLA

Jacques Polack Conference
6 Million Unemployed Mortgagors

Fraction of Mortgages Held By Unemployed (PSID Heads, Weighted)
Record Foreclosure Delay

Figure: Median Months in Delinquency (LPS Data, At Least 60+ Days Late)
Introduction

Idea:

- Foreclosure delays provide new way to smooth consumption for unemployed mortgagors
- Unemployed mortgagors use ability to skip mortgage payments for long periods without being foreclosed and then resume payments and exit the foreclosure process as implicit line of credit

Incentives Effects:

- Foreclosure means line of credit runs out, strong incentives to accept job (PSID, SCF)
- Similar to spike out of unemployment at UI expiration
- More insurance means better matches—may improve output

Unique Conditions:

- Past unemployed mortgagors use cash-out refi’s to smooth (Hurst and Stafford 2002)
- Now, historical number underwater, no more cash out refi’s

Kyle Herkenhoff and Lee Ohanian (UCLA) November 12, 2012 Jacques Polack Conference
Introduction

Idea:
- Foreclosure delays provide new way to smooth consumption for unemployed mortgagors
- Unemployed mortgagors use ability to skip mortgage payments for long periods without being foreclosed and then resume payments and exit the foreclosure process as implicit line of credit

Incentives Effects:
- Foreclosure means line of credit runs out, strong incentives to accept job (PSID, SCF)
- Similar to spike out of unemployment at UI expiration
- More insurance means better matches- may improve output
Introduction

Idea:
- Foreclosure delays provide new way to smooth consumption for unemployed mortgagors
- Unemployed mortgagors use ability to skip mortgage payments for long periods without being foreclosed and then resume payments and exit the foreclosure process as implicit line of credit

Incentives Effects:
- Foreclosure means line of credit runs out, strong incentives to accept job (PSID, SCF)
- Similar to spike out of unemployment at UI expiration
- More insurance means better matches- may improve output

Unique Conditions:
- Past unemployed mortgagors use cash-out refi’s to smooth, (Hurst and Stafford 2002)
- Now, historical number underwater, no more cash out refi’s
Goal: Quantify impact of foreclosure delay on aggregates-
- How much higher is unemployment because of delay?
- Does ability to find better matches increase aggregate output?
  ▶ Output trade-off: not working vs. waiting and working for better match
Introduction, Continued

**Goal:** Quantify impact of foreclosure delay on aggregates-
- How much higher is unemployment because of delay?
- Does ability to find better matches increase aggregate output?
  - Output trade-off: not working vs. waiting and working for better match

**Model Framework:**
- Construct model economy with:
  1. Frictional employment - Search and wage acceptance decisions
  2. Rich set of mortgage payment choices
  3. High aggregate state time and low aggregate state
- **Quantitative Experiment:** Consider an initially depressed economy that transits to high state
  - Compare unemployment and other variables in this economy with normal time to foreclose, and with delayed foreclosure.
Introduction, Continued

**Goal:** Quantify impact of foreclosure delay on aggregates-
- How much higher is unemployment because of delay?
- Does ability to find better matches increase aggregate output?
  - Output trade-off: not working vs. waiting and working for better match

**Model Framework:**
- Construct model economy with:
  1. Frictional employment - Search and wage acceptance decisions
  2. Rich set of mortgage payment choices
  3. High aggregate state time and low aggregate state
- **Quantitative Experiment:** Consider an initially depressed economy that transits to high state
  - Compare unemployment and other variables in this economy with normal time to foreclose, and with delayed foreclosure.

**Preview of Findings:**
- Delays increase UR $\frac{1}{2}$ %
- Better matches increase output by $\frac{2}{10}$ %
Spike out of Unemployment near Foreclosure, Panel Study of Income Dynamics (PSID)

Unemployment Rate (PSID Heads Homeowners, 2009)

- Current
- 30+ Days Late
- 60+ Days Late
- 90+ Days Late
- In Foreclosure
Increase in Employment near Foreclosure, Panel Study of Income Dynamics (PSID)

Employment Per Capita (PSID Heads, Homeowners, 2009)

- Current
- 30+ Days Late
- 60+ Days Late
- 90+ Days Late
- In Foreclosure
Unemployment Rate by Delinquency Status, Mortgagors (Weighted, Heads of House)

Source: 2007-2009 SCF
Formula: U/(E+U) by Lateness
Corroborating Evidence, Survey of Consumer Finances

Employment Per Capita by Delinquency Status, Mortgagors (Weighted, Heads of House)

Source: 2007-2009 SCF
Formula: Employed/WAPOP by Lateness

<table>
<thead>
<tr>
<th></th>
<th>Current</th>
<th>30+ Days Late</th>
<th>60+ Days Late</th>
<th>90+ Days Late</th>
<th>In Foreclosure</th>
<th>Foreclosed/Paid Off</th>
<th>Modified</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current</strong></td>
<td>96.0</td>
<td>1.5</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>2.5</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>30+ Days Late</strong></td>
<td>41.2</td>
<td>38.7</td>
<td>15.9</td>
<td>0.4</td>
<td>0.0</td>
<td>3.8</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>60+ Days Late</strong></td>
<td>18.7</td>
<td>21.0</td>
<td>24.7</td>
<td>30.4</td>
<td>2.6</td>
<td>2.5</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>90+ Days Late</strong></td>
<td>7.1</td>
<td>3.4</td>
<td>4.7</td>
<td>68.4</td>
<td>14.6</td>
<td>1.8</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>In Foreclosure</strong></td>
<td>5.3</td>
<td>1.1</td>
<td>0.1</td>
<td>7.8</td>
<td>75.2</td>
<td>10.6</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Foreclosed/Paid Off</strong></td>
<td>0.0</td>
<td>0.1</td>
<td>0.0</td>
<td>0.8</td>
<td>0.6</td>
<td>98.5</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Modified</strong></td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Kyle Herkenhoff and Lee Ohanian (UCLA)  
November 12, 2012  
Jacques Polack Conference

<table>
<thead>
<tr>
<th>Current</th>
<th>30+ Days Late</th>
<th>60+ Days Late</th>
<th>90+ Days Late</th>
<th>In Foreclosure</th>
<th>Foreclosed/Paid Off</th>
<th>Modified</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>96.0</td>
<td>1.5</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>2.5</td>
</tr>
<tr>
<td>30+ Days Late</td>
<td>41.2</td>
<td>38.7</td>
<td>15.9</td>
<td>0.4</td>
<td>0.0</td>
<td>3.8</td>
</tr>
<tr>
<td>60+ Days Late</td>
<td>18.7</td>
<td>21.0</td>
<td>24.7</td>
<td>30.4</td>
<td>2.6</td>
<td>2.5</td>
</tr>
<tr>
<td>90+ Days Late</td>
<td>7.1</td>
<td>3.4</td>
<td>4.7</td>
<td>68.4</td>
<td>14.6</td>
<td>1.8</td>
</tr>
<tr>
<td>In Foreclosure</td>
<td>5.3</td>
<td>1.1</td>
<td>0.1</td>
<td>7.8</td>
<td>75.2</td>
<td>10.6</td>
</tr>
<tr>
<td>Foreclosed/Paid Off</td>
<td>0.0</td>
<td>0.1</td>
<td>0.0</td>
<td>0.8</td>
<td>0.6</td>
<td>98.5</td>
</tr>
<tr>
<td>Modified</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

- **Modified**: 78.4, 12.4, 2.3, 3.7, 1.3, 0.2, 1.7
<table>
<thead>
<tr>
<th></th>
<th>Current</th>
<th>30+ Days Late</th>
<th>60+ Days Late</th>
<th>90+ Days Late</th>
<th>In Foreclosure</th>
<th>Foreclosed/Paid Off</th>
<th>Modified</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>96.0</td>
<td>1.5</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>2.5</td>
<td>0.0</td>
</tr>
<tr>
<td>30+ Days Late</td>
<td>41.2</td>
<td>38.7</td>
<td>15.9</td>
<td>0.4</td>
<td>0.0</td>
<td>3.8</td>
<td>0.0</td>
</tr>
<tr>
<td>60+ Days Late</td>
<td>18.7</td>
<td>21.0</td>
<td>24.7</td>
<td>30.4</td>
<td>2.6</td>
<td>2.5</td>
<td>0.0</td>
</tr>
<tr>
<td>90+ Days Late</td>
<td>7.1</td>
<td>3.4</td>
<td>4.7</td>
<td>68.4</td>
<td>14.6</td>
<td>1.8</td>
<td>0.0</td>
</tr>
<tr>
<td>In Foreclosure</td>
<td>5.3</td>
<td>1.1</td>
<td>0.1</td>
<td>7.8</td>
<td>75.2</td>
<td>10.6</td>
<td>0.0</td>
</tr>
<tr>
<td>Foreclosed/Paid Off</td>
<td>0.0</td>
<td>0.1</td>
<td>0.0</td>
<td>0.8</td>
<td>0.6</td>
<td>98.5</td>
<td>0.0</td>
</tr>
<tr>
<td>Modified</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Detailed Version**
Model

Necessary Features

- Decision theoretic model: nondurable consumption, utility flow from housing (rent or own), disutility from search
- Pay mortgage, skip payments (default ≠ foreclosure), or sell
- If unemployed, make search effort decisions
- Draw wages from stationary distribution, accept or reject → reservation wages
Model

Necessary Features

- Decision theoretic model: nondurable consumption, utility flow from housing (rent or own), disutility from search
- Pay mortgage, skip payments (default \(\neq\) foreclosure), or sell
- If unemployed, make search effort decisions
- Draw wages from stationary distribution, accept or reject \(\rightarrow\) reservation wages

Mechanism:

- With long foreclosure delays, economize on search effort, wait for high wage draws
- Foreclosure imminent, reservation wage declines and search effort increases
- Like UI running out, spike out of unemployment near exhaustion (foreclosure).
Experiment

**Turbulence Experiment:**
- Start the model economy in bad times (Ljungqvist and Sargent (1998))
- Elevated job destruction with parametric home price decline
- Look at economic recovery with and without foreclosure delay
  - Treat delay as exogenous - Mortgage Servicer Settlement, Robo Signing, Moratoria
**Figure:** Model Transitions with Delays vs. Great Recession Data

<table>
<thead>
<tr>
<th>Current</th>
<th>30 Days Late</th>
<th>60 Days Late</th>
<th>90+ Days Late</th>
<th>Renter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>98.4 (Data: 1.7) 1.6</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>30 Days Late</td>
<td>25.4 (Data: 24.4)</td>
<td>0.0</td>
<td>73.5</td>
<td>0.0</td>
</tr>
<tr>
<td>60 Days Late</td>
<td>0.0 (Data: 11.3) 25.0</td>
<td>0.0</td>
<td>74.0</td>
<td>1.1</td>
</tr>
<tr>
<td>90+ Days Late</td>
<td>0.0</td>
<td>0.0</td>
<td>(Data: 6.8) 88.2</td>
<td>(Data: 5.7) 5.0</td>
</tr>
<tr>
<td>Renter</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Figure: Model Transitions (Red Underlined=No Delay, Black=Delay)

<table>
<thead>
<tr>
<th></th>
<th>Current</th>
<th>30 Days Late</th>
<th>60 Days Late</th>
<th>90+ Days Late</th>
<th>Renter</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current</strong></td>
<td>98.5</td>
<td>1.5</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>98.4</td>
<td>(Data: 1.7)</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>30 Days Late</strong></td>
<td>19.0</td>
<td>0.0</td>
<td>79.8</td>
<td>0.0</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>(Data: 24.4)</td>
<td>25.4</td>
<td>0.0</td>
<td>73.5</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>60 Days Late</strong></td>
<td>0.0</td>
<td>22.3</td>
<td>0.0</td>
<td>76.8</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>(Data: 11.3)</td>
<td>25.0</td>
<td>0.0</td>
<td>74.0</td>
</tr>
<tr>
<td><strong>90+ Days Late</strong></td>
<td>0.0</td>
<td>0.0</td>
<td>18.3</td>
<td>54.1</td>
<td>27.7</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>0.0</td>
<td>(Data: 4.6)</td>
<td>(Data: 88.3)</td>
<td>(Data: 5.7)</td>
</tr>
<tr>
<td><strong>Renter</strong></td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>100.0</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Figure: Unemployment Difference
Figure: Unemployment Rate by Delinquency Status
Additional Predictions

Model Predictions:
- With delays, default stock 2x as large (8-12% more defaults)
- Delays increase homeownership rate by 3%
- Implied real rate of interest on implicit line of credit is 18%

Real Rate = \frac{\text{Consumption Equivalent of Becoming Renter} \times \text{Pr(Foreclosed)} + \text{Repayment} \times \text{Pr(Not Foreclosed)}}{\text{Mortgage Payment}}
Conclusions

Purely Positive Lens to this Point

- Foreclosure delay impacts labor market and recovery
  - Pros: More homeownership and better matches increase output by $\frac{2}{10}$ %
  - Cons: Increase in unemployment rate $\frac{1}{2}$ % and 2x more defaults

Normative Work

- Should we subsidize default? (Mortgage Servicer Settlement 2012, CARD 2009)
- **Preliminary Findings:** Default improves welfare, especially for low income, low asset households with limited credit access