Labor Market Upheaval, Default Regulations, and Consumer Debt

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Since 2009

- Big changes in household leverage
Drop in leverage
Motivation

Since 2009

- Big changes in household leverage
- Big changes in the level and type of consumer default
How You Can Default

- US offers consumers formal route to repudiate debt:
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  - Chapter 7: in exchange for assets above threshold, debts are removed
How You Can Default

- US offers consumers formal route to repudiate debt:
  - Chapter 7: in exchange for assets above threshold, debts are removed
- Also an informal method
  - ...just stop paying
Change in default

![Graph showing DQ Debt Rate and BK Rate from 2004 to 2013](graph.png)
Two relevant things happened just before, and during, this period...
Labor Market Upheaval
In late 2005, BAPCPA roughly doubled bankruptcy filing cost

- Seems to have come as a surprise
Our Question

"What role did bankruptcy reform and labor market changes play in the paths of debt, delinquency, and bankruptcy over the Great Recession?"
What we do

Step 1: Feed in labor market upheaval, by setting job separation rates and job finding rates.

Step 2: Compare model predictions for paths of debt, delinquency, and bankruptcy to data.

Step 3: Use counterfactuals to understand the roles of labor markets and bankruptcy law in outcomes.

Evaluate Step 2 with and without 2005 BK reform.

Evaluate Step 2 with and without changes in labor markets.
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Life cycle model with uninsurable idiosyncratic earnings risk:
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- Deterministic education and lifecycle component
- Persistent component
- Transitory component
- Job offers and option to reject
- (I’ll simplify the notation for income process in what follows)
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Two ways to default on debt:
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Two ways to default on debt:
- Bankruptcy: incur filing costs and high utility cost, debts are eliminated
Model Framework

- Life cycle model with uninsurable idiosyncratic earnings risk:
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- Riskless saving with exog. return, risky borrowing with default premium

- Two ways to default on debt:
  - Bankruptcy: incur filing costs and high utility cost, debts are eliminated
  - Delinquency: incur lower utility cost, debt is reset
Value Function, Solvent

\[ v_{j,e}^{d=0}(b_{-1}, y) = \max_b \left\{ u(c) + \beta \sum_{y'} \pi(y'|y) v_{j+1,e}(b, y') \right\} \]

subject to

\[ c + q_{j,e}(b, y)b = b_{-1} + y \]
Value Function, DQ

\[ v_{j,e}^{d=1}(y) = u(c) - \psi_D + \beta \sum_{y'} \pi(y'|y) v_{j+1,e}(h_{j,e}(y), y') \]

subject to

\[ c = y \]

key object is \( h_{j,e}(\cdot) \), as explained below
Value Function, BK

\[ v_{j,e}^{d=2}(y) = u(c) - \psi_B + \beta \sum_{y'} \pi(y'|y) v_{j+1,e}(0, y') \]

subject to

\[ c = y - \Delta(y) \]

\( \Delta(y) \) will differ by employment status b/c filing costs can be waived.
Optimal Behavior of an indebted household

\[ v_{j,e}(b_{-1}, y) = \max \{ v_{j,e}^{d=0}(b_{-1}, y), v_{j,e}^{d=1}(y), v_{j,e}^{d=2}(y) \} \]
Delinquency and Debt

- If faced with a delinquent, optimizing lenders (who lack commitment) solve:

\[ h_{j,e}(y) = \arg \max_b \{ b q_{j,e}(b, y) \} \]

- Price of face value \( b \) of new debt:

\[ q_{j,e}(b, y) = \frac{Q}{1 + r + \phi} \]
Pricing and Delinquency

- A law of motion

\[ \mathbb{Q} = \sum_{y'} \pi(y'|y) 1(d_{j+1},e(b,y') = 0) + \]
\[ \sum_{y'} \pi(y'|y) 1(d_{j+1},e(b,y') = 1) \left[ \frac{q_{j+1,e(h_{j+1},e(y'),y')}h_{j+1,e(y')}}{b} \right] \]
Earnings Risk

- Quarterly model—key for capturing delinquency
- Wage risk and employment risk
- UI, DI, Food stamps
- Follow Low, Meghir, Pistaferri (2010)
  - Wages and employment both risky, depend on education
  - Workers matched with firms, quality specific to current match $m$
Earnings Risk, con’t

- Wage Risk

\[
\ln (w_j(e, n, m)) = x_j(e) + n_j + m_j
\]

\[
n_j = n_{j-1} + \zeta_j
\]
Earnings Risk, con’t

- **Employment Risk**
  - if employed, offers arrive with Pr. \( \lambda^E_e \)
  - if unemployed, offers arrive with Pr. \( \lambda^N_e \)
  - All matches break with exog. separation rate: \( \delta_e \)

- **Disposable Earnings**
  - \( y_j(n, m, p) = p(w_j(e, n, m)h(1 - \tau) - F_e) \)
  - \( p \in \{0, 1\} \)

- **Food Stamps**
  - \( T_j(y) \)

- **A Disability system in place too (like UI, but absorbing)**
Preferences

\[ u(c, p) = \frac{(c \exp(\varphi e p))^{1-\gamma}}{1 - \gamma} \]
## Parameters

<table>
<thead>
<tr>
<th></th>
<th>Discount factor</th>
<th>Non-pecuniary cost</th>
<th>Non-pecuniary cost</th>
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<tbody>
<tr>
<td></td>
<td>$\beta$</td>
<td>$\psi_B$</td>
<td>$\psi_D$</td>
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<tr>
<td>Discount factor</td>
<td>0.957</td>
<td>1.786</td>
<td>0.104</td>
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<td>BK</td>
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<td>DQ</td>
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<table>
<thead>
<tr>
<th></th>
<th>Data</th>
<th>Model</th>
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<tbody>
<tr>
<td>Share of debt in 90+ DQ, %</td>
<td>8.9</td>
<td>7.8</td>
</tr>
<tr>
<td>Bankruptcy rate, %</td>
<td>0.26</td>
<td>0.26</td>
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<tr>
<td>Mean (assets/income)</td>
<td>4.07</td>
<td>3.09</td>
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Repayment Decisions–Persistent shocks

Results

<table>
<thead>
<tr>
<th>Current Stock of Debt, b</th>
<th>Current Productivity, n</th>
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</thead>
<tbody>
<tr>
<td>Solvency</td>
<td>Bankruptcy</td>
</tr>
<tr>
<td>−0.5</td>
<td>−0.45</td>
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<tr>
<td>−0.4</td>
<td>−0.35</td>
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<tr>
<td>−0.3</td>
<td>−0.25</td>
</tr>
<tr>
<td>−0.2</td>
<td>−0.15</td>
</tr>
<tr>
<td>−0.1</td>
<td>−0.05</td>
</tr>
</tbody>
</table>
Repayment Decisions–Persistent shocks

- good times for wages means repayment
- bad times for wages means delinquency–get debt forgiveness!
- medium times for wages and a lot of debt means bankruptcy–no forgiveness in DQ.
- Notice: conditional on shocks–no switches in choice of default path
  - Repayment branch value function is only one that depends on debt
On the determination of $h(.)$ and the decision to enter DQ
Debt and Default in The Great Recession

- Shocks to job finding and separation
- Each shock unanticipated, expected to be permanent (can be relaxed)
Model Approximation, shocks
The Shocks

The graph shows the Job Finding Rate and Separation Rate over the years from 2004 to 2013. The Job Finding Rate of UN, Left is represented by a green line, and the Job Finding Rate of EM, Left is represented by a blue dashed line. The Separation Rate is represented by a green line. The graph indicates fluctuations in the rates over time, with notable changes around the years 2006 and 2008.
Tracking Employment Rates

<table>
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<tr>
<th>Year</th>
<th>Employment Rate</th>
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<tbody>
<tr>
<td>2004</td>
<td>0.65</td>
</tr>
<tr>
<td>2005</td>
<td>0.70</td>
</tr>
<tr>
<td>2006</td>
<td>0.75</td>
</tr>
<tr>
<td>2007</td>
<td>0.80</td>
</tr>
<tr>
<td>2008</td>
<td>0.85</td>
</tr>
<tr>
<td>2009</td>
<td>0.90</td>
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</table>

Data: Benchmark

Bk Reform and the GR

December 6, 2013
Tracking Unemployment Duration

![Graph showing average unemployment duration over years from 2004 to 2013. The graph compares data to benchmark model predictions.](image-url)
Bk Reform Mattered for Observed Bankruptcy

- Model accounts well for path of bankruptcy during GR
Model Generates Rise in Delinquencies in seen in GR

- Model suggests that labor markets deterioration key for DQ, reform does not matter.
The distribution of renegotiated debt

- BK Reform would have made DQ a lot tougher—but labor markets “intervened”
Bankruptcy in the GR–decompositions

- Job finding is central, not separation
Delinquency in the GR–decompositions

- Again, movements in job finding rate are the key
Bankruptcy Reform and Deleveraging

- Debt more sensitive to income in model than data–lenders here learn immediately
The Proximate Cause of Deleveraging

![Graph showing interest rates over time](image_url)
What we’ve done...

- Have taken a step towards understanding consumer credit use and default during Great Recession
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- Model quantitatively consistent with both bk and dq paths in GR
Concluding Remarks

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- Have taken a step towards understanding consumer credit use and default during Great Recession
- Model quantitatively consistent with both bk and dq paths in GR
- Model suggests that:
  - bankruptcy reform did in fact lower filing rates, given the evolution of labor market risk
  - delinquency not strongly affected by BK reform
  - changes in job finding rates key for default and debt