Consumer Bankruptcy: A Fresh Start

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presented by Nawid Siassi

January 23, 2013
Motivation

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Aim: Quantitatively analyze these two bankruptcy arrangements!
Two opposing forces. The possibility of filing for bankruptcy ...

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This paper: Evaluate this trade-off using an incomplete-markets life-cycle model with income and expense shocks. Calibrate to U.S. economy and Fresh Start system. Assess counterfactual.
The OLG Model

- households maximize

$$\sum_{j=1}^{J} \beta^{j-1} u(c_j/n_j)$$

where $c_j$ is total consumption and $n_j$ is the household size at age $j$ in equivalence scale units (deterministic)
The OLG Model

- Households maximize

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where \( c_j \) is total consumption and \( n_j \) is the household size at age \( j \) in equivalence scale units (deterministic).

- Labor income of household \( i \) is given by

\[
\begin{align*}
y^i_j &= a^i_j \bar{e}_j \\
a^i_j &= z^i_j \eta^i_j
\end{align*}
\]

where \( \bar{e}_j \) is the age-dependent deterministic component, \( z^i_j \) is a persistent shock and \( \eta^i_j \) is a transitory shock.
• i.i.d. expense shock (directly changes net asset position):

\[ \kappa \geq 0, \quad \kappa \in K \]

where \( K \) is a finite set; probability of \( \kappa_i \) is denoted by \( \pi_i \);

• risk-free savings interest rate \( r^s \)
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- risk-free savings interest rate \( r^s \)

- loans are one-period uncontingent bond contracts; bond market competitive; intermediaries observe loan size, earnings and age

- denote: loan size \( d \) and bond price \( q^b(d, z, j) \)
Bankruptcy

Costs of declaring bankruptcy:

1. temporary exclusion from credit markets \(\Rightarrow\) no borrowing/saving
2. partial garnishment of income \(\Rightarrow\) consider linear garnishment: \(\Gamma = \gamma y\)
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Two bankruptcy systems:

1. Fresh Start (FS): full discharge of all debt, no seizure of future income, “waiting period” of 6 years
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Two bankruptcy systems:

1. Fresh Start (FS): full discharge of all debt, no seizure of future income, “waiting period” of 6 years
2. No Fresh Start (NFS): life-long liability for debt, no discharge of debt possible, outstanding debt is rolled over at specified interest rate $\bar{r}$ (lower than market rate), linear garnishment of income
Consumer Problem: Fresh Start system

\[ V_j(d, z, \eta, \kappa) = \max_{c, d'} \left[ u(c/n_j) + \beta E \max\{ V_{j+1}(d', z', \eta', \kappa'), \tilde{V}_{j+1}(z', \eta') \} \right] \]

\[ \text{s.t. } c + d + \kappa \leq \bar{e}_j z \eta + q^b(d', z, j)d' \]

\[ V: \text{ value of repaying debt; } \tilde{V}: \text{ value of declaring bankruptcy; } \tilde{W}: \text{ value of not repaying} \]
\[ \text{expense shock in period following bankruptcy} \]
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\[ \tilde{V}_j(z, \eta) = u(c/n_j) + \beta E \max \{ V_{j+1}(0, z', \eta', \kappa'), \tilde{W}_{j+1}(z', \eta', \kappa) \} \]

s.t. \quad c = (1 - \gamma) \bar{e}_j z \eta

\( V \): value of repaying debt; \( \tilde{V} \): value of declaring bankruptcy; \( \tilde{W} \): value of not repaying expense shock in period following bankruptcy
Consumer Problem: Fresh Start system

\[ V_j(d, z, \eta, \kappa) = \max_{c, d'} \left[ u(c/n_j) + \beta E \max \{ V_{j+1}(d', z', \eta', \kappa'), \bar{V}_{j+1}(z', \eta') \} \right] \]

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subject to \[ c = (1 - \gamma) \bar{e}_j z \eta \]

\[ \bar{W}_j(z, \eta, \kappa) = u(c/n_j) + \beta E \max \{ V_{j+1}(d', z', \eta', \kappa'), \bar{V}_{j+1}(z', \eta') \} \]

subject to \[ c = (1 - \gamma) \bar{e}_j z \eta \quad , \quad d' = (\kappa - \gamma \bar{e}_j z \eta)(1 + \bar{r}) \]

\( V \): value of repaying debt; \( \bar{V} \): value of declaring bankruptcy; \( \bar{W} \): value of not repaying expense shock in period following bankruptcy
Consumer Problem: No Fresh Start system

\[ V_{j}^{NFS}(d, z, \eta, \kappa) = \max_{c, d', I} \left[ u(c/n_j) + \beta EV_{j+1}^{NFS}(d', z', \eta', \kappa) \right] \]

s.t. \[ c + d + \kappa \leq \bar{e}_j z \eta + q^b(d', z, j)d' \]

if \( I = 0 \)

\[ c = (1 - \gamma)\bar{e}_j z \eta \]

if \( I = 1 \)

\[ d' = \max\{d + \kappa - \gamma \bar{e}_j z \eta, 0\}(1 + \bar{r}) \]

if \( I = 1 \)

where \( l_j(d + \kappa, z, \eta) \) denotes the decision to declare bankruptcy
competitive market for financial intermediaries ⇒ zero expected profits on each loan!

bond price determined by default probability
competitive market for financial intermediaries $\Rightarrow$ zero expected profits on each loan!

- bond price determined by default probability
- period length 3 years, age 20 onwards, retirement at age 65
- income process: estimates from the literature
competitive market for financial intermediaries $\Rightarrow$ zero expected profits on each loan!

- bond price determined by default probability
- period length 3 years, age 20 onwards, retirement at age 65
- income process: estimates from the literature
- no uncertainty during retirement: version of Social Security
- $\gamma = 0.355$ to match debt-to-income ratio; rollover rate $\bar{r} = 0.20$
main cause to file for bankruptcy: 67.5% job loss, 22.1% family issues (e.g. divorce), 19.3% medical expenses (multiple responses permitted)

assume that $\kappa \in \{\kappa_1, \kappa_2\}$; calibrate using data on out-of-pocket medical bills, divorces, unplanned pregnancies

<table>
<thead>
<tr>
<th>Shock</th>
<th>Magnitude</th>
<th>Fraction of avg income</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\kappa_1$</td>
<td>$32,918$</td>
<td>0.26</td>
<td>7.10%</td>
</tr>
<tr>
<td>$\kappa_2$</td>
<td>$102,462$</td>
<td>0.82</td>
<td>0.46%</td>
</tr>
</tbody>
</table>
Table 2. Benchmark Model versus Data

<table>
<thead>
<tr>
<th>Results</th>
<th>Rule</th>
<th>Debt/Earnings</th>
<th>Defaults</th>
<th>Avg $r^b$</th>
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<tbody>
<tr>
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<td>8.4%</td>
<td>0.71%</td>
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<td>US data, avg. 1995-1999</td>
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Table 3—Defaults by Reason

<table>
<thead>
<tr>
<th>Expense shock</th>
<th>Low</th>
<th>High</th>
<th>None</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No decrease in income</td>
<td>63.7%</td>
<td>9.9%</td>
<td>1.6%</td>
<td>75.2%</td>
</tr>
<tr>
<td>Fall in persistent income only*</td>
<td>8.1%</td>
<td>1.5%</td>
<td>5.3%</td>
<td>14.9%</td>
</tr>
<tr>
<td>Negative transitory shock only**</td>
<td>7.0%</td>
<td>1.1%</td>
<td>0.1%</td>
<td>8.3%</td>
</tr>
<tr>
<td>Fall in persistent income and negative transitory shock</td>
<td>0.9%</td>
<td>0.2%</td>
<td>0.6%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Total</td>
<td>79.7%</td>
<td>12.7%</td>
<td>7.6%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

* Fall in persistent income = fall in persistent income shock relative to previous period.
** Negative transitory shock = lowest of the three possible values of the transitory income shock.
Benchmark Results

A. Bankruptcies over the Life Cycle
Benchmark Results

Borrowing Limits by Age, Fresh Start
## Table 4. Benchmark FS versus NFS

<table>
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<td>8.4%</td>
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<td>NFS</td>
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Fresh Start vs. No Fresh Start

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A. Smoothing over Time (FS vs. NFS)

B. Smoothing across States (FS vs. NFS)
Importance of Uncertainty

- Evaluation of bankruptcy regimes sensitive to nature and magnitude of idiosyncratic uncertainty
- NFS better if expense shocks are proportional to persistent earnings