Accounting for Households Financial Distress

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(Preliminary and Incomplete)

The views expressed are those of the individual authors and do not necessarily reflect official positions of the Federal Reserve Bank of St. Louis, Richmond, Kansas City, and the Federal Reserve System, or the Board of Governors.
Motivation

• Consider households financial distress defined as:
  1. Max out available credit card debt.
  2. Late making credit card payments.
  3. No wealth.

• Many US household live in financial distress (10-20%).

• Yet, our models miss two key features: life-cycle profile and persistence of financial distress.
This paper

- Evidence on financial distress (incidence and persistence).
- Show that standard model, calibrated to get the incidence, misses on the persistence.
- Introduce key features to reconcile model and data
  1. Persistent expenditure shocks.
  2. Permanent discount factor heterogeneity.
  3. Informal default.
- Show that these features are important to get right the answers to policy relevant questions.
Life cycle profile of % people with negative net worth

Source: PSID 1998-2010
Life cycle profile of % of people in default

Source: Equifax 1999-2010
Life cycle profile of % of people used all credit

Source: Equifax 1999-2010
Persistence of negative net worth

Source: PSID 1998-2010
Persistence of default

Source: Equifax 1999-2010
Persistence of “used all credit”

Source: Equifax 1999-2010
Models’ common features

- Incomplete markets and partial equilibrium.
- Households live up to $T$ periods and work until age $R \leq T$.
- Household’s $i$ earnings process has 4 components

$$y_{i,t}(age_i) = \exp(f(age_i) + \underbrace{s_i}_{\text{life-cycle}} + \underbrace{z_{i,t}}_{\text{permanent}} + \underbrace{\varepsilon_{i,t}}_{\text{persistent}} + \underbrace{\varepsilon_{i,t}}_{\text{transitory}}),$$

where $z_{i,t} = \rho_z z_{i,t-1} + e_i,t$ and the shocks follow Gaussian distributions.

- Post-retirement income depends on the last realization of $z$.
- Households cannot commit to repay their debt.
- There is a consumption cost (income garnishment) of filing bankruptcy.
Benchmark model

- Pricing of risk of bankruptcy at the household level.
  - Chatterjee, Corbae, Nakajima and Rios-Rull (2007) – CCNR.

- Additionally:
  1. Shocks only to income.
  2. Households are ex-ante identical.
  3. Only formal default (bankruptcy) allowed – prorated like CCNR.
Benchmark model vs. Data

Life-cycle profile of Net Worth

Life-cycle profile of Default

Life-cycle profile of “used all credit”

Persistence of Net Worth

Persistence of Default

Persistence of “used all credit”
Expense shock model

  - Life-cycle component matches average personal health care expenditures by age from Centers for Medicare & Medicaid Services.

- Recalibrate the model to replicate the (non-prorated) default rate and the share of households in debt.
Health expenditures shocks model vs. Data

Life-cycle profile of Net Worth

Life-cycle profile of Default

Life-cycle profile of “used all credit”

Persistence of Net Worth

Persistence of Default

Persistence of “used all credit”
Discount factor heterogeneity model

- Allow for two permanent types in terms of the rate at which households discount the future, $\beta$.

- Calibrate the new feature to replicate facts about net worth.

- Recalibrate the model to replicate the default rate, the share (and persistence) of households in debt.
Discount factor heterogeneity model vs. Data

Life-cycle profile of Net Worth

Life-cycle profile of Default

Life-cycle profile of “used all credit”

Persistence of Net Worth

Persistence of Default

Persistence of “used all credit”
Informal default model

- Allow for two forms of default: formal (bankruptcy) and informal (delinquency).
- In delinquency, households are charged a penalty rate of 20%.
- Bankruptcy involves a period of financial exclusion (exit rate $\lambda$).
- Recalibrate the model to replicate formal and informal default, and the share and persistence of households in debt.
Informal default model vs. Data

Life-cycle profile of Net Worth

Life-cycle profile of Default

Life-cycle profile of “used all credit”

Persistence of Net Worth

Persistence of Default

Persistence of “used all credit”
Policy implications of alternative models

- Increasing consumption cost of default
- Cap on borrowing rates
Increasing consumption cost of default by 10 %

<table>
<thead>
<tr>
<th>Model</th>
<th>ppt. change in neg. net worth</th>
<th>ppt. change in default</th>
<th>ppt. change in dq</th>
<th>CE welfare gain (in %)</th>
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</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>1.13</td>
<td>-0.15</td>
<td>-0.06</td>
<td>0.06</td>
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<tr>
<td>Expense shocks</td>
<td>1.07</td>
<td>-0.45</td>
<td>-0.04</td>
<td>0.04</td>
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<tr>
<td>Expense + beta-het</td>
<td>1.19</td>
<td>-0.47</td>
<td>-0.09</td>
<td>0.10</td>
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<tr>
<td>Expense + DQBK</td>
<td>0.40</td>
<td>-0.06</td>
<td>-0.09</td>
<td>0.02</td>
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</tbody>
</table>
Conclusions

• Standard model cannot account both for the incidence and persistence of financial distress
• Preference heterogeneity and persistent expenditure shocks help reconcile model with data
Baseline model calibration

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Target</th>
<th>Model</th>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>prorated default rate (%)</td>
<td>0.38</td>
<td>0.38</td>
<td>$\beta$</td>
<td>0.9735</td>
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<tr>
<td>% in debt</td>
<td>10.82</td>
<td>10.82</td>
<td>$\tau$</td>
<td>55,000</td>
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### Expenditure model calibration

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<td>default rate (%)</td>
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<tr>
<td>% in debt</td>
<td>10.82</td>
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**Expenditure process**

<table>
<thead>
<tr>
<th>Source</th>
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<tbody>
<tr>
<td>Centers for Medicare &amp; Medicaid Services</td>
<td>$\phi_n$</td>
<td>0.03</td>
</tr>
<tr>
<td>Banks et al 2015</td>
<td>$\rho_x$</td>
<td>0.81</td>
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<tr>
<td>Banks et al 2015</td>
<td>$\sigma_v$</td>
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## Beta-het model calibration

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<td>$Pr(in\ debt_{t+2}</td>
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<td>in\ debt_t)$</td>
<td>12.37</td>
<td>12.37</td>
<td>$Pr(\beta_h</td>
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## DQ-BK model calibration

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<tr>
<td>$Pr(\text{in debt}_{t+2}</td>
<td>\text{in debt}_{t})$</td>
<td>34.97</td>
<td>18.93</td>
<td>$\lambda$</td>
</tr>
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