Accounting for Households Financial Distress

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(Preliminary and Incomplete)

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.

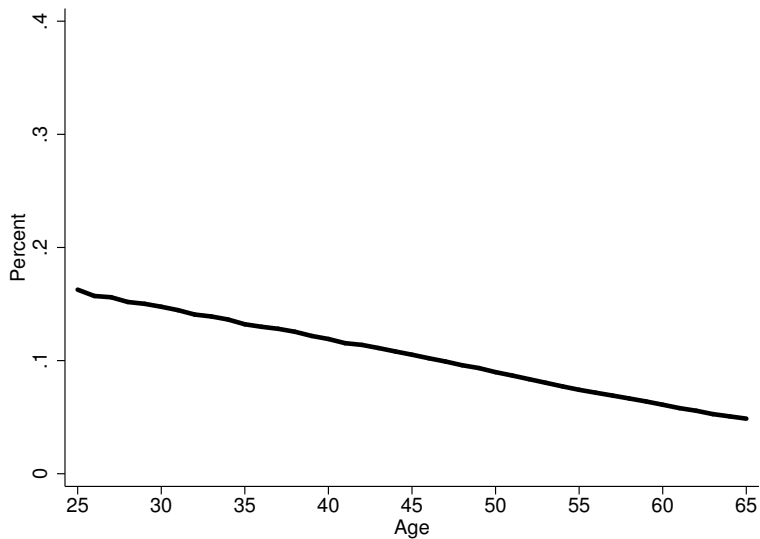# Life cycle profile of % people with negative net worth
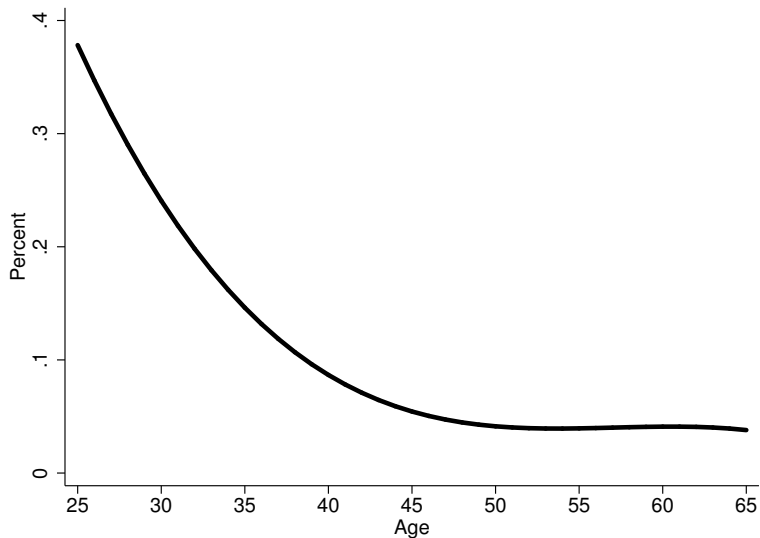
Source: PSID 1998-2010

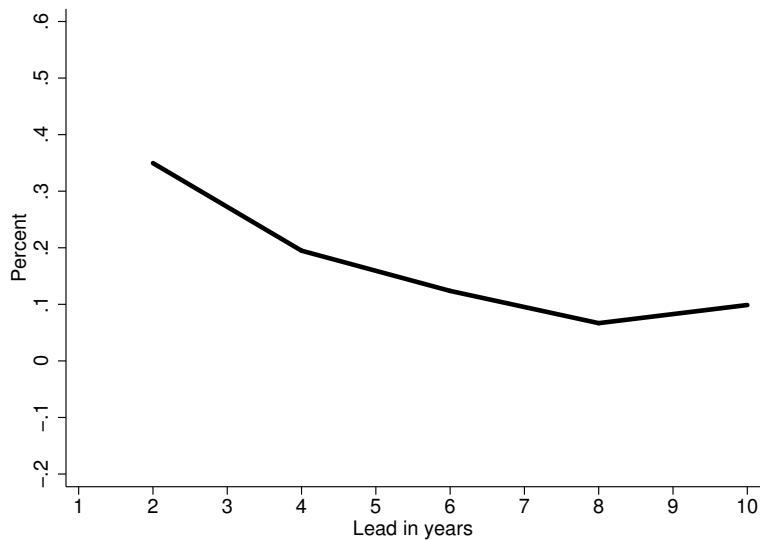# Life cycle profile of % of people in default
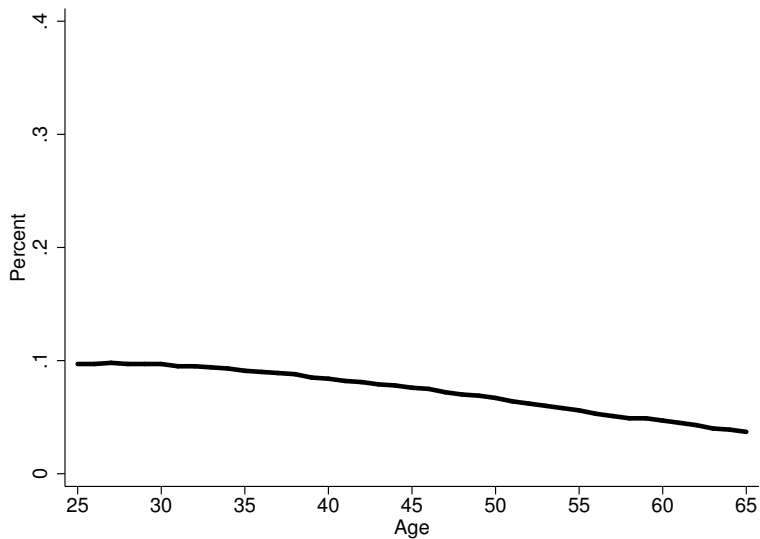
Source: Equifax 1999-2010

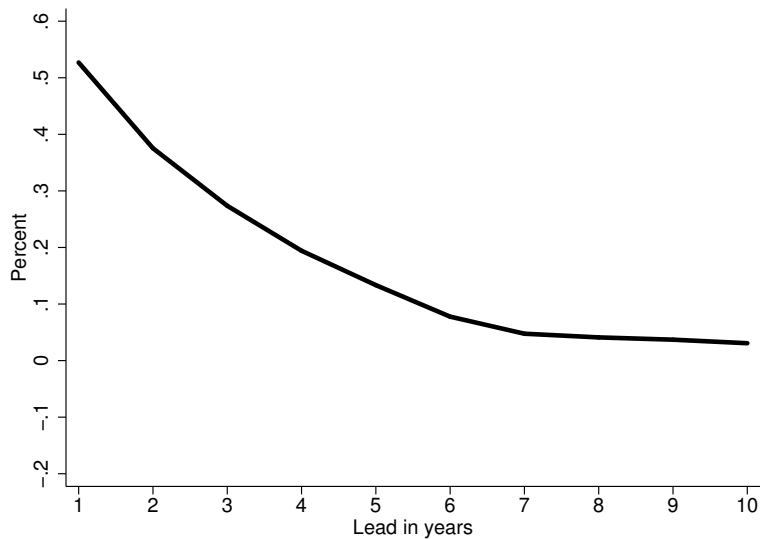# Life cycle profile of % of people used all credit

Source: Equifax 1999-2010
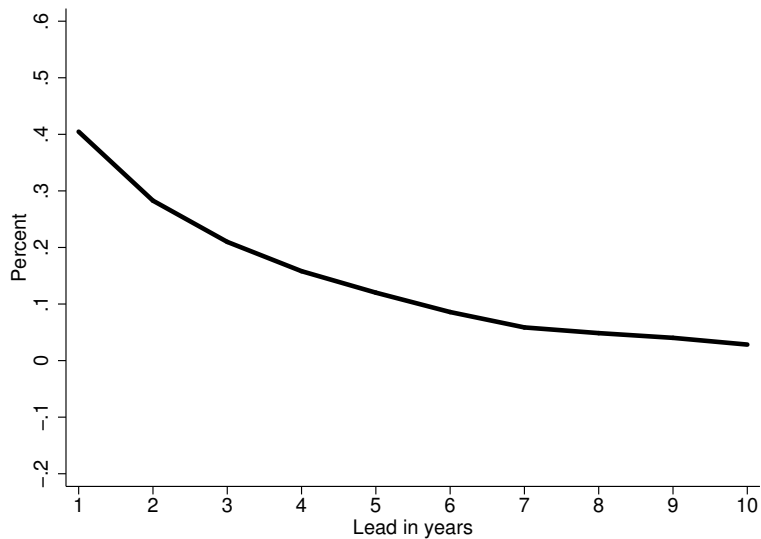
Persistence of negative net worth

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

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

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.
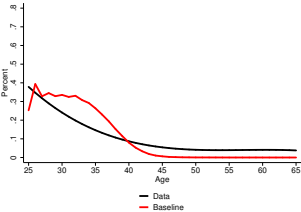
Benchmark model

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

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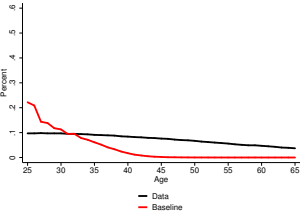 3. Only formal default (bankruptcy) allowed – prorated like CCNR.
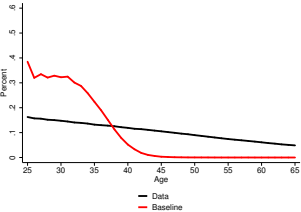
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Benchmark model vs. Data
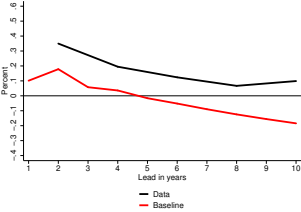

Life-cycle profile of Net Worth
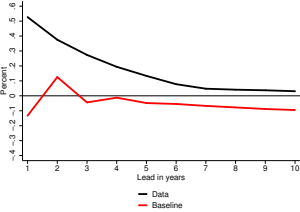
Life-cycle profile of Default
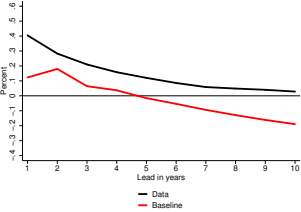
Life-cycle profile of "used all credit"

Persistence of Net Worth

Persistence of Default
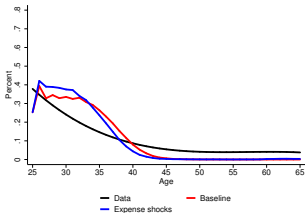
Persistence of "used all credit"

Expense shock model

- Add a stochastic process for health expenditures shocks as estimated by Banks, Blundell, Levell, and Smith (2015).
  - 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.
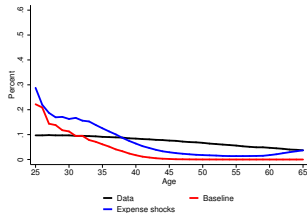
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Health expenditures shocks model vs. Data

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, β.

- 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.

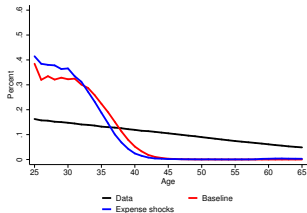# Discount factor heterogeneity model vs. Data
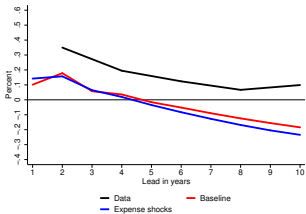

Life-cycle profile of Net Worth
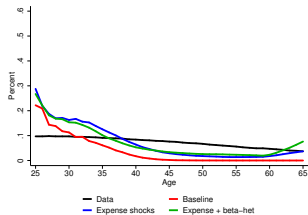
Life-cycle profile of Default
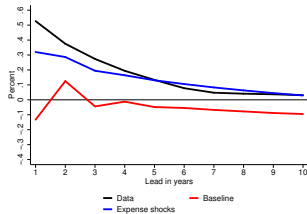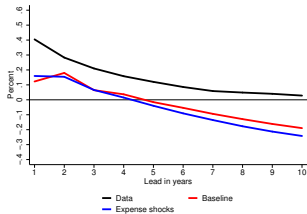
Life-cycle profile of "used all credit"

Persistence of Net Worth

Persistence of Default
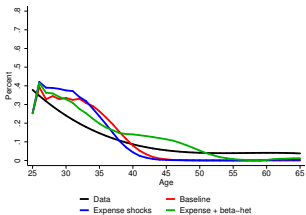
Persistence of "used all credit"
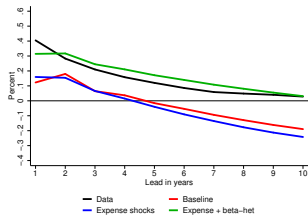
Informal default model

- 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 λ).

- Recalibrate the model to replicate formal and informal default, and the share and persistence of households in debt.
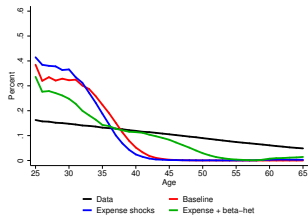
Informal default model vs. Data

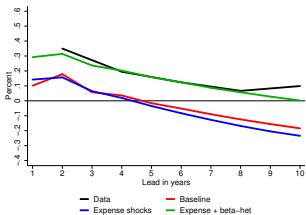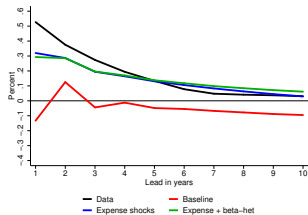Life-cycle profile of Net Worth
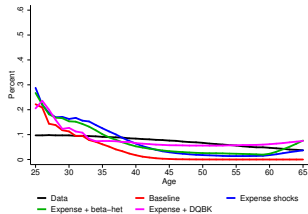
Life-cycle profile of Default

Life-cycle profile of "used all credit"
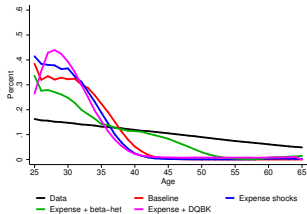
Persistence of Net Worth

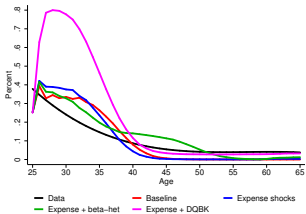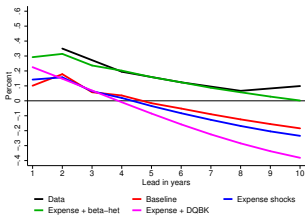Persistence of Default
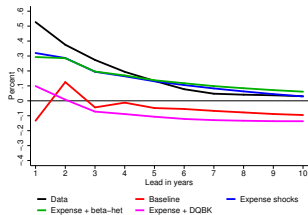
Persistence of "used all credit"
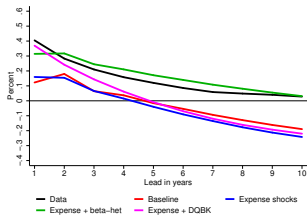
Policy implications of alternative models

- Increasing consumption cost of default
- Cap on borrowing rates

Increasing consumption cost of default by 10 %

Model	ppt. change in			CE welfare gain (in %)
	neg. net worth	default	dq	
Baseline	1.13	-0.15	–	0.06
Expense shocks	1.07	-0.45	–	0.04
Expense + beta-het	1.19	-0.47	–	0.10
Expense + DQBK	0.40	-0.06	-0.09	0.02

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

Statistic	Target	Model	Parameter	Value
prorated default rate (%)	0.38	0.38	β	0.9735
% in debt	10.82	10.82	τ	55,000

Expenditure model calibration

Statistic	Target	Model	Parameter	Value
default rate (%)	7.3	7.3	β	0.982
% in debt	10.82	10.82	τ	43,825
Expenditure process				
Centers for Medicare & Medicaid Services			ϕ_n	0.03
Banks et al 2015			ρ_x	0.81
Banks et al 2015			σ_ν	0.8

Beta-het model calibration

Statistic	Target	Model	Parameter	Value
default rate (%)	7.3	7.3	τ	47,179
% in debt	10.82	12.98	β_l	0.89
$Pr(\text{in } debt_{t+2} \mid \text{in } debt_t)$	34.97	31.42	β_h	1.00
$Pr(\text{in } debt_{t+4} \mid \text{in } debt_t)$	19.48	20.20	$Pr(\beta_l \mid \alpha_l)$	0.11
$Pr(\text{in } debt_{t+6} \mid \text{in } debt_t)$	12.37	12.37	$Pr(\beta_h \mid \alpha_h)$	0.69
Expenditure process				
Centers for Medicare & Medicaid Services			ϕ_n	0.03
Banks et al 2015			ρ_x	0.81
Banks et al 2015			σ_ν	0.8

DQ-BK model calibration

Statistic	Target	Model	Parameter	Value
default rate (%)	0.7	0.7	τ_{def}	40,000
delinquency rate (%)	7.3	3.7	τ_{dq}	0.00093
% in debt	10.82	22.4	β	0.998
$Pr(\text{in debt}_{t+2}|\text{ in debt}_t)$	34.97	18.93	λ	0.93
Expenditure process				
Centers for Medicare & Medicaid Services			ϕ_n	0.03
Banks et al 2015			ρ_x	0.81
Banks et al 2015			σ_v	0.8