Health, Consumption, and Inequality

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PRELIMINARY

Motivation

- Inequality (economic inequality) is one of the themes of our time.
  - Large body of literature documenting inequality in labor earnings, income, and wealth across countries and over time

    Katz, Murphy (QJE 1992); Heathcote et al (RED 2010); Piketty (2014); Kuhn, Ríos-Rull (QR 2016)

- We also know of large socio-economic gradients in health outcomes
  - In mortality

    Kitagawa, Hauser (1973); Pijoan-Mas, Rios-Rull (Demo 2014); De Nardi et al (ARE 2016) Chetty et al (JAMA 2016)
  - In many other health outcomes

    Marmot et al (L 1991); Smith (JEP 1999); Bohacek, Crespo, Mira, Pijoan-Mas (2017)

▷ We want to compare and relate inequality in *health outcomes* to *pure economic inequality*.

What we do

- We build measures of inequality between socio-economic groups
  - We use the notion of Compensated Variation to compare
- We take into account
  - Differences in Consumption
  - Differences in Health
  - Differences in Mortality
  - The actions that will be taken by the disadvantaged groups to improve health and mortality when given more resources
- In doing so, we develop novel ways of measuring

a/ Health-related preferences

b/ Health-improving technology with medical expenditures

The project

(1) Write and calibrate a simple model of consumption and health choices

- Useful to understand identification from a simple set of statistics

(2) Estimate big quantitative model with over-identifying restrictions

- Adds more realistic features

▷ Part (2) still preliminary

Stylized Model

Setup

Simple framework to quantify the welfare differences across types

1. Perpetual old: survival and health transitions age-independent

2. Complete markets: annuities and health-contingent securities

   (Guarantees stationarity; allows to ignore financial risks associated to health)

3. Choice of non-medical c *vs* medical consumption x

4. Types e differ in
   - resources a^e
   - initial health distribution μ_h^e
   - survival probability γ_h^e
   - health transitions $\Gamma_{hh'}^e(x)$

5. Instantaneous utility function depends on consumption and health

$$u(c, h) = \alpha_h + \chi_h \log c$$

6. Let health $h \in \{h_g, h_b\}$

Optimization

- The recursive problem

$$V^e(a,h) = \max_{x,c,a'_{h'}} \left\{ u(c,h) + \beta\, \gamma^e_h \sum_{h'} \Gamma^e_{hh'}(x)\; V^e(a'_{h'},h') \right\}$$

$$\text{s.t.} \qquad x + c + \gamma^e_h \sum_{h'} q^e_{hh'}\; a'_{h'} = a(1+r)$$

- In equilibrium $(1+r) = \beta^{-1}$ and $q^e_{hh'} = \Gamma^e_{hh'}$
- Standard CM result:

$$\frac{1}{\chi_g} c_g = \frac{1}{\chi_b} c_b \qquad \text{and} \qquad c_h = c'_h$$

- And the optimal choice for x would be

$$u_c(c_h,h) = \beta\, \gamma_h \sum_{h'} \frac{\partial \Gamma^e_{hh'}(x)}{\partial x}\; V^e(a',h')$$

The value of types

- We restrict individuals of the same type e to have all the same reources a_h^e

- The attained value in each health state is given by

$$\begin{pmatrix} V_g^e \\ V_b^e \end{pmatrix} = A \begin{pmatrix} \alpha_g + \chi_g \log c_g^e \\ \alpha_b + \chi_b \log \frac{\chi_b}{\chi_g} c_g^e \end{pmatrix}$$

where

$$A = \left[I - \beta \begin{pmatrix} \gamma_g^e & 0 \\ 0 & \gamma_b^e \end{pmatrix} \begin{pmatrix} \Gamma_{gg}^e(x_g^e) & 1 - \Gamma_{gg}^e(x_g^e) \\ \Gamma_{bg}^e(x_g^e) & 1 - \Gamma_{bg}^e(x_g^e) \end{pmatrix} \right]^{-1}$$

- And the unconditional value of the average person of type e is given by

$$V^e = \mu_g^e V_g^e + \left(1 - \mu_g^e\right) V_b^e$$

Welfare comparisions

1. Holding x constant

$$V\left(c_c^g;\ \mu_h^c,\, \Gamma_h^c,\, \gamma_h^c,\, \alpha_h,\, \chi_h\right) = V\left(\left[1+\Delta_c\right] c_g^d;\ \mu_h^d,\, \Gamma_h^d,\, \gamma_h^d,\, \alpha_h,\, \chi_h\right)$$

2. Allowing x to be chosen optimally

$$V\left(c_c^g;\ \mu_h^c,\, \Lambda^c,\, \gamma_h^c,\, \alpha_h,\, \chi_h\right) = V\left(c_g^d(\left[1+\Delta_a\right] a, .);\ \mu_h^d,\, \Lambda^d,\, \gamma_h^d,\, \alpha_h,\, \chi_h\right)$$

(where Λ^c and Λ^d are the vector of parameters determining health transitions)

– Then we report $\left[1+\Delta_{(x+c)}\right]$

Data

Expenditure data

- Consumption data:
  - PSID 2005-2013, white males aged 50-88

  a/ Non-durable goods and services *(excluding education and medical)*

  b/ Out of Pocket Medical Expenditures
    - hospital / nursing home
    - doctors
    - prescriptions / in-home medical care / other services
    - health insurance premia

- Obtain (equivalized) life-cycle profiles by education and health
- Annuitize the life-cycle profiles to produce c_h^e and x_h^e
- Scale them up to match 2005 NIPA per capita figures

  (x/c is 0.18 in NIPA, 0.14 in PSID)

Measuring health modifiers

- In bad health: around 15% consumption loss for both types

$$\frac{\chi_b}{\chi_g} = \frac{c^c(h_b)}{c^c(h_g)} = 0.82 \quad \text{and} \quad \frac{\chi_b}{\chi_g} = \frac{c^d(h_b)}{c^d(h_g)} = 0.88$$

- We set
  - $\chi_g = 1$ (normalization) and $\chi_b = 0.85$

▷ Health and consumption are complements

Finkelstein, Luttmer, Notowidigdo (JEEA 2012)

Koijen, Van Nieuwerburgh, Yogo (JF 2016)

▷ Footnote: fully-fledged model with incomplete markets and life cycle delivers similar χ_b

Measuring health distributions

- We use all waves in HRS, white males aged 50-88
- Health stock measured by self-rated health
  - $h = h_g \quad \text{if} \quad h = 1, 2, 3$
  - $h = h_b \quad \text{if} \quad h = 4, 5$
- At age 50, college graduates are in better health than HS dropouts
  - $\mu_g^c = 0.94$
  - $\mu_g^d = 0.59$

Measuring survival

1. Estimate health-dependent survival probabilities at each age

   (Pijoan-Mas, Ríos-Rull (2014) show that education does not matter)

2. Aggregate them into life expectancies (at age 50)

   ▷ Health matters a lot

e_g	$=$	33.1	Life expectancy if always in good health
e_b	$=$	19.3	Life expectancy if always in bad health

3. Obtain the age-independent survival rates γ_h consistent with these

Measuring health transitions

1. Estimate health transitions for each type e at each age

2. Aggregate them into average duration (at age 50) of each health state conditional on survival

   ▷ Large differences by education

$e^c(h_g)$	$=$	20.5	Duration good health, college grad
$e^d(h_g)$	$=$	9.6	Duration good health, dropout
$e^c(h_b)$	$=$	2.6	Duration bad health, college grad
$e^d(h_b)$	$=$	8.0	Duration bad health, dropout

3. Obtain the age-independent health transitions consistent with these

   ▷ College health transitions are better

$\Gamma^c_{gg} - \Gamma^d_{gg}$	$=$	0.056	College are better at remaining in good health
$\Gamma^c_{bg} - \Gamma^d_{bg}$	$=$	0.261	and even better at recovering good health

Measuring value of life in good and bad health

The idea

We use standard measures in clinical analysis to obtain α_g and α_b

1. Value of Statistical Life (VSL)
   - From wage compensation of risky jobs
     Viscusi, Aldy (2003)
   - Range of numbers: \$4.0M–\$7.5M to save one statistical life
   - This translates into \$100,000 per year of life saved
   - ▷ Calibrate the model to deliver same MRS between survival probability and consumption flow
     Becker, Philipson, Soares (AER 2005); Jones, Klenow (AER 2016)

2. Quality Adjusted Life Years (QALY)
   - Trade-off between years of life under different health conditions
   - From patient/individual/household surveys: no *revealed preference*

The value of life across health states

The data

- HUI3 is a health-related quality of life scoring used in clinical analysis
  Horsman et al (2003), Feeny et al (2002), Furlong et al (1998)
- It measures quality of Vision, Hearing, Speech, Ambulation, Dexterity, Emotion, Cognition, Pain up to 6 levels
- It aggregates them into utility values to compare years of life under different health conditions
  - Score of 1 reflects perfect health (all levels at its maximum)
  - Score of 0 reflects dead
  - A score of 0.75 means that a person values 4 years under his current health equal to 3 years in perfect health
- We use data on *Health Utility Index Mark 3* (HUI3) from a subsample of 1,156 respondents in the 2000 HRS

Measuring difference in value of life across health states

Mapping into the model

- In the data we find that
  - Average score for $h = h_g$ is 0.85 and for $h = h_b$ is 0.60
- Imagine an hypothetical state of perfect health $\bar{h}$. Then,

$$\begin{aligned} u(c_g^e, h_g) &= 0.85\, u(\bar{c}^e, \bar{h}) \\ u(c_b^e, h_b) &= 0.60\, u(\bar{c}^e, \bar{h}) \end{aligned}$$

- Therefore,

$$\frac{u(c_g^e, h_g)}{u(c_b^e, h_b)} = \frac{\alpha_g + \chi_g \log c_g^e}{\alpha_b + \chi_b \log c_b^e} = \frac{0.85}{0.60}$$

Results

Welfare differences without endogenous health

Welfare of different types

	CG	HSG	HSD	CG-HSG	CG-HSD
Cons while in Good Health	$41,348	$31,817	$23,621	30%	75%
Expected Longevity	30.8	28.5	25.2	2.3	5.6
Expctd Good Health Duration	27.5	22.2	14.3	5.3	12.2
Compensated variation (cons)					
health diff: none				1.30	1.75
health diff: quantity of life				2.05	6.37
health diff: quality of life				2.05	6.63
health diff: both				3.21	24.95

Welfare differences

Comments

- Welfare differences due to quality and quantity of life are huge
- Question

  If health is so important, why low types do not give up consumption to buy better health?

- Our answer

  By revealed preference, it must be that out-of-pocket health spending is not too useful in improving health after age 50

The life extending technology

Functional form

- Assume the following functional forms:

$$\Gamma^e_{gg}(x) = \lambda^e_{0,g} + \lambda_{1,g} \frac{x^{1-\nu_g}}{1-\nu_g}$$
$$\Gamma^e_{bg}(x) = \lambda^e_{0,b} + \lambda_{1,b} \frac{x^{1-\nu_b}}{1-\nu_b}$$

- This form is flexible:
  - it can impute all the advantage as being *intrinsic* to the type ($\lambda_{1,h} = 0$)
    (It could also be the result of different non-monetary investments, which we will ignore.)
  - or as being the result of having *more resources* ($\lambda^e_{0,h} = 0$)
  - or something in between.

- This adds 8 parameters: ν_g, ν_b $\quad \lambda_{1,g}, \lambda_{1,b} \quad \lambda^c_{0,g}$, $\lambda^c_{0,b}$, $\lambda^d_{0,g}$, $\lambda^d_{0,b}$

The life extending technology

Identification with only two types

We have 8 equations to solve for the 8 parameters

1. The 4 FOC of x for each e and h

$$\chi_h \frac{1}{c_h^e} = \beta \, \gamma_h \, \lambda_{1,h} \, (x_h^e)^{-\nu_h} \, \left(V_g^e - V_b^e\right)$$

   a/ The health spending ratio between education types identifies ν_h

$$\left(\frac{x_h^c}{x_h^d}\right)^{\nu_h} = \frac{c_h^c}{c_h^d} \frac{\left(V_g^c - V_b^c\right)}{\left(V_g^d - V_b^d\right)} \qquad \forall h \in \{g, b\}$$

   b/ The health spending level identifies $\lambda_{1,h}$

$$\frac{(x_h^e)^{\nu_h}}{\lambda_{1,h}} = \beta \, \gamma_h \, c_g^e \, (V_g^e - V_b^e) \qquad \forall h \in \{g, b\}$$

2. The 4 observed health transitions yield the $\lambda_{0,h}^e$ for e and $h \in \{g, b\}$.

Health technology

Summary

- OOP money matters little (after age 50): 0.3 out of 5.6 years
  - RAND Health Insurance experiment of 1974-1982
    Aron-Dine et al (JEP 2013)
  - Oregon Medicaid Extension lottery of 2008
    Finkelstein et al (QJE 2012)

- We recover small curvature: $\nu_g = 0.35$ and $\nu_b = 0.25$
  - Income elasticity of health spending larger than non-medical expenditure
    (consistent with Hall, Jones (QJE 1997) for representative agent)
  - But in the data expenditure share similar between types
    (consistent with Aguiar, Bils (AER 2015) with CEX data)
  - ▷ This is because value of good health ($V_g^e - V_b^e$) higher for dropouts

- We recover small λ_{1g} and λ_{1b}
  - This is because of low ratio of medical to non-medical expenditure (0.18)

Health technology

PANEL A: HEALTH TRANSITION PARAMETERS

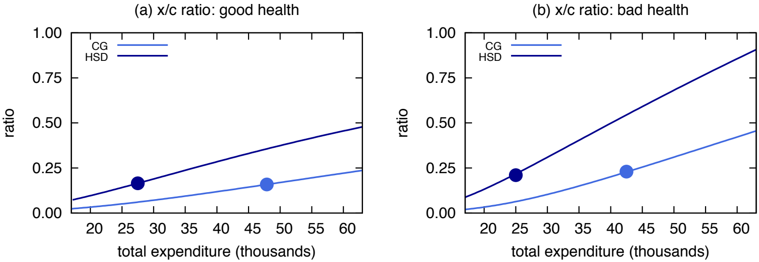
	Γ_{hg}	λ^{e}_{0h}	λ_{1h}	ν_h
Good health				
College	0.951	0.935	3.5×10^{-5}	0.35
Dropouts	0.895	0.884		
Bad health				
College	0.386	0.367	1.6×10^{-5}	0.25
Dropouts	0.125	0.114		

PANEL B: DECOMPOSITION OF THE LIFE EXPECTANCY GRADIENT

	Full model	μ^c	x^c	λ^{c}_{0h}
Life expectancy	5.6	0.7	0.3	4.8
Healthy life expectancy	12.2	1.8	0.7	11.5

Optimal health spending

- Because $\eta_g, \eta_b < 1$ the ratio x/c increases with overall spending
- But at same level of spending, x/c larger for HSD



Welfare differences with endogenous health

Welfare of different types

	CG-HSG	CG-HSD
Compensated variations (total expenditure)		
health diff: none	1.25	1.64
health diff: quantity and quality of life	2.86	21.30
endogenous health choices	2.26	6.86

Quantitative Model

Why?

- Theory:
  - Out of Pocket Expenditures Improve Health
- Data:
  - Across (age, educational) groups higher spending leads to better health transitions.
  - But in panel dimension Higher Expenditures lead to Worse outcomes.
- Resolution:
  - A (unobserved) shock to health that shapes the health outlook including the returns to investment

Set up

- Add: *life cycle*, *incomplete markets*
  - The individual state is given by $\omega = (e, i, h, a) \in E \times I \times H \times A \equiv \Omega$.

- Health outlook shock $\eta \in \{\eta_g, \eta_b\}$
  - Changes both the probability of health outcomes next period and the return to health investment (The health transition $\Gamma^{ei}(h'|h, x)$ depends on η)
  - It happens between t and $t+1$, after consumption c has been chosen
  - Probabilities of η_g: $\pi^{ih}_{\eta_g}$

- Mechanism to account for individual variation in health spending. Alternative to measurement error to maintain implied wealth transitions: Medical treatment implementation shock ϵ
  - Once contingent health spending $x(\omega, \eta)$ has been chosen, shock determines actual treatment $\tilde{x} = x(\omega, \eta)\, \epsilon$ obtained.
  - Distribution: $\log \epsilon \sim N\left(-\frac{1}{2}\sigma^2_\epsilon, \sigma^2_\epsilon\right)$

The Bellman equation

The retiree version

- The household chooses c, $x(\eta)$, $y(\eta)$ such that

$$v^{ei}(h,a) = \max\left\{u^i(c,h) + \beta^e \gamma^i(h) \sum_{h' \eta} \pi_\eta^{ih} \int_\epsilon \Gamma^{ei}[h' \mid h, \eta, x(\eta)\epsilon]\ v^{e,i+1}[h', a']\ f(d\epsilon)\right\}$$

- Subject to
  - the budget constraint

$$c + x(\eta) + y(\eta) = a,$$

  - the law of motion for cash in hand

$$a' = [y(\eta) - (\epsilon - 1)\, x\,(\eta)]R + w^e$$

Two FOC

- Consumption

$$u_c^i[h, c(\omega)] = \beta^e \gamma^i(h) R \sum_{h' \eta} \pi_\eta^{ih} \int_\epsilon \Gamma^{ei}[h' \mid h, \eta, x(\omega, \eta)\epsilon] \; u_c^{i+1}\left[h', c\left(\omega, \eta, h', \epsilon\right)\right] f(d\epsilon)$$

- Health investments at each state η:

$$R \sum_{h'} \int_\epsilon \epsilon \, \Gamma^{ei}[h' \mid h, \eta, x(\omega, \eta)\epsilon] \; u_c^{i+1}[h', c\left(\omega, \eta, h', \epsilon\right)] \; f(d\epsilon) =$$

$$\sum_{h'} \int_\epsilon \epsilon \, \Gamma_x^{ei}[h' \mid h, \eta, x(\omega, \eta)\epsilon] \; v^{e,i+1}\{h', a'\left(\omega, \eta, \epsilon\right)\} \; f(d\epsilon)$$

Estimation

Preliminaries

- We aggregate wealth data a_j into quintiles $p_j \in P \equiv \{p_1, \dots, p_5\}$
  - State space is the countable set $\widehat{\Omega} \equiv E \times I \times H \times P$
- Need to specify functional forms
  - Utility function

$$u^i(h, c) = \alpha_h + \chi_h^i \frac{c^{1-\sigma_c}}{1-\sigma_c}$$

  - Health transitions

$$\Gamma^{ie}(g|h, \eta, x) \quad = \quad \lambda_{0\eta}^{ieh} + \lambda_{1\eta}^{ih} \frac{x^{1-\nu^h}}{1-\nu^h}$$

- Need to estimate several transitions in HRS data
  - Survival rates $\widetilde{\gamma}_h^i$
  - Health transitions $\widetilde{\Gamma}(h_g|\omega)$
  - Health transitions conditional on health spending $\widetilde{\varphi}(h_g|\omega, \tilde{x})$
  - Joint health and wealth transitions $\widetilde{\Gamma}(h', p'|\omega)$

General strategy

- Estimate vector of parameters θ by GMM without solving the model

  $\rightarrow$ Use the restrictions imposed by the FOC

- Two types of parameters

  1/ Preferences: $\theta_1 = \{\beta^e, \alpha_h, \chi_h^i, \sigma_c\}$

  - Can be estimated independently from other parameters
  - Uses consumption Euler equation to obtain $\beta^e, \chi_h^i, \sigma_c$
  - Adds VSL and HRQL conditions to estimate α_h

  2/ Health technology and shocks $\theta_2 = \{\lambda_{0\eta}^{ieh}, \lambda_{1\eta}^{ieh}, \nu^{ih}, \pi_\eta^{ih}, \sigma_\epsilon^2\}$

  - Uses medical spending Euler equation plus several health transitions
  - Uses $\theta_1 = \{\beta^e, \alpha_h, \chi_h^i, \sigma_c\}$ as input
  - We observe neither η_j nor ϵ_j: need to recover $x\left(\omega_j, \eta_j\right)$ and posterior probability of η_j from observed health spending $\tilde{x}_j$

Consumption Euler equation

- We use the sample average for all individuals j of the same type ω as a proxy for the expectation over η, h', and ϵ

$$\beta^e R \; \tilde{\gamma}_h^i \frac{1}{N_\omega} \sum_j \mathbf{I}_{\omega_j=\omega} \frac{\chi_{h'_j}^{i+1}}{\chi_h^i} \left(\frac{c'_j}{c_j} \right)^{-\sigma} = 1 \qquad \forall \omega \in \widetilde{\Omega}$$

- It has the disadvantage of (implicitly) using the health transitions in the PSID, which may be different from the ones in the HRS
- Alternatively, we can use the functional form for the health transition and the observed health spending
  - But then we cannot separate the estimation in two pieces

Identifying the health technology: The Problem

- Key problem: How to deal with unobserved health shock.
- We have to construct the posterior probability given observed health investment.
- We do so by posing an implementation error.
  - Conditional on type, different households are imputed different probabilities of having had the health shock given their expenditures.

Identifying the health technology: The moment conditions

- Health spending Euler equation: $\forall \omega \in \widetilde{\Omega}$ and $\forall \eta \in \{\eta_g, \eta_b\}$

$$R \sum_{h'} \frac{1}{M_{\omega,h'}} \sum_j \mathbf{I}_{\omega_j=\omega, h'_j=h'} \, \widetilde{x}_j \Gamma^{e_j i_j}[h'_j \mid h_j, \eta, \widetilde{x}_j] \, \chi^{i_j+1}(h'_j) \left(c'_j\right)^{-\sigma_c} Pr\left[\eta|\omega_j, \widetilde{x}_j\right] =$$

$$\sum_{h'} \frac{1}{M_{\omega,h'}} \sum_j \mathbf{I}_{\omega_j=\omega, h'_j=h'} \, \widetilde{x}_j \Gamma_x^{e_j i_j}[h'_j \mid h_j, \eta, \widetilde{x}_j] \, v^{e_j, i_{j+1}}\left(h'_j, p'_j\right) Pr\left[\eta|\omega_j, \widetilde{x}_j\right]$$

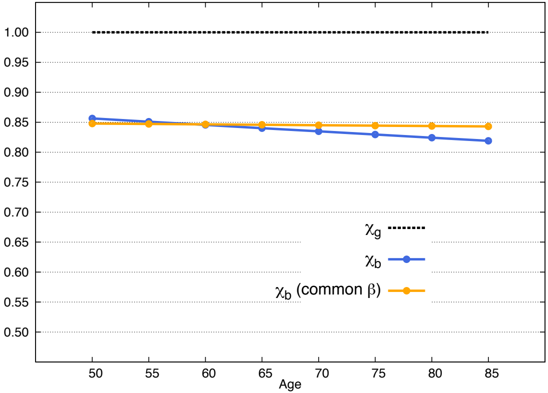
- Health transitions: $\forall \omega \in \widetilde{\Omega}$

$$\widetilde{\Gamma}\left(h_g \mid \omega\right) = \sum_\eta \pi_\eta^{ih} \left(\lambda_{0\eta}^{ieh} + \frac{\lambda_{1\eta}^{ieh}}{1-\nu^{ih}} \frac{1}{M_\omega} \sum_j \mathbf{I}_{\omega_j=\omega} \, \widetilde{x}_j^{1-\nu^{ih}} Pr\left[\eta|\omega_j, \widetilde{x}_j\right] \right)$$

Preliminary Estimates

Preferences

- Normalize $\chi_g^i = 1$ and parameterize $\chi_b^i = \chi_b^0 \left(1 + \chi_b^1\right)^{(i-50)}$
- We obtain
  - consumption expenditure is less valuable in poor health
  - this does not change much with ageing



Preferences

Men sample (with $r = 2\%$)

	β edu specific		β common	
σ	1.5050		1.5710	
β^d (s.e.)	0.8986	(0.0170)	0.8569	(0.0066)
β^h (s.e.)	0.8702	(0.0090)	0.8569	(0.0066)
β^c (s.e.)	0.8551	(0.0099)	0.8569	(0.0066)
χ_b^0 (s.e.)	0.8564	(0.0521)	0.8478	(0.0537)
χ_b^1 (s.e.)	-0.0013	(0.0037)	-0.0002	(0.0038)
observations	15,432		15,432	
moment conditions	228		228	
parameters	6		4	
J stat (p-value)	241.54	(0.1878)	247.59	(0.14413)
α_g	1.747		0.989	
α_b	1.240		0.702	

The uneducated are not more impatient. They just have worse health outlook

Transitions

Summary

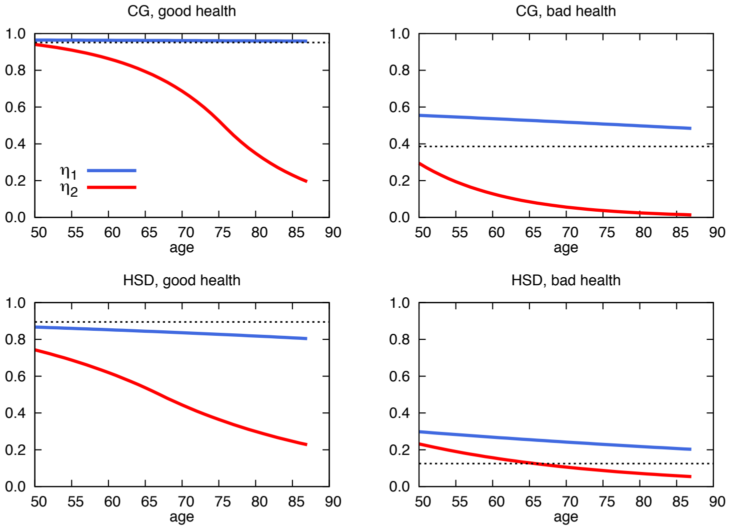
- So far: Fix $\pi_1^{ih} = 0.75$
- Curvatures consistent with simple model

	Life cycle + IM	Perpetual Old + CM
σ_c	1.57	1
ν_g	0.95	0.35
ν_b	0.21	0.25

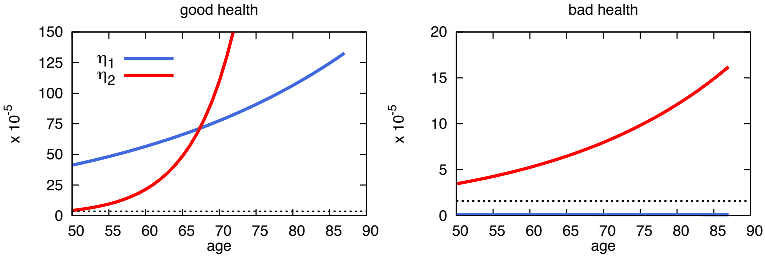
- Need to process role of estimated λ_0, λ_1

Transitions

λ_0



Transitions: $\lambda_1 * 10^{-5}$



Still to be Processed

- The properties of the investment technology
- The Compensated variation measure of educational inequality

Conclusions

Conclusions

- We have discussed how to measure inequality between types by incorporating
  - differences in consumption
  - differences in life expectancy
  - differences in health
- We have found much larger numbers than those associated to consumption alone.
- We estimate both health preferences and a production function from out of pocket expenditures (in the U.S.)
  - Limited value to out of pocket health investments, especially with bad health.
- We still have to finish
  - Fully-fledged life cycle model without complete markets and trace its welfare implications.
  - So far not that different from calibrated simple version.

Remaining Important Issues

1. Estimation is closely dependant on U.S. features
   - Limited health insurance.
   - Not well defined role of Out of Pocket Expenditures. We are not sure if it means the same things across education groups.

2. Would love to use non U.S. data

Tables

Estimation of logit underlying the $\widetilde{\varphi}(h_g|\omega, \tilde{x})$

White males

	coeff	*t-stat*
CG	2.14	(8.51)
HSG	1.13	(5.90)
CG x age	-0.02	(-5.41)
HSG x age	-0.01	(-3.88)
Wealth q1	2.22	(7.84)
Wealth q2	2.02	(7.62)
Wealth q3	1.64	(6.34)
Wealth q4	0.92	(3.64)
Wealth q1 x age	-0.02	(-5.11)
Wealth q2 x age	-0.02	(-5.31)
Wealth q3 x age	-0.02	(-4.42)
Wealth q4 x age	-0.01	(-2.65)
good health	4.13	(25.19)
good health x age	-0.02	(-10.29)
oop med (*in $1,000*)	-21.34	(-6.44)
oop med x age	0.23	(5.11)
constant	-2.11	(-8.67)
age	0.01	(2.54)
N	60761	

Evaluation of $\widetilde{\varphi}(h_g|\omega, \tilde{x})$ at selected points

Probability of health transition for white males, 65 year-old, wealth in 3rd quintile
by education, health, and oop medical spending

	CG		HSD	
$\tilde{x}$	$\Pr(h' = h_g\|h_g, \tilde{x})$	$\Pr(h' = h_g\|h_b, \tilde{x})$	$\Pr(h' = h_g\|h_g, \tilde{x})$	$\Pr(h' = h_g\|h_b, \tilde{x})$
top 10	0.909	0.438	0.805	0.245
top 25	0.915	0.457	0.817	0.259
median	0.918	0.466	0.823	0.267
bottom 25	0.919	0.471	0.825	0.270
bottom 10	0.919	0.472	0.826	0.272