

Why Aren't More Families Buying Life Insurance?

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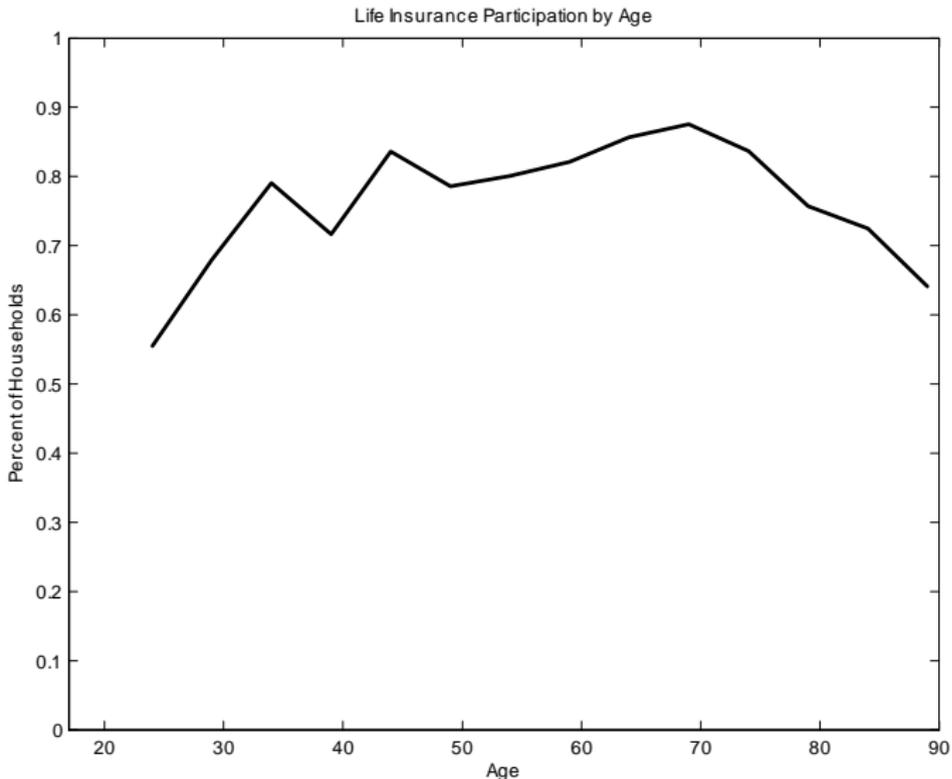
Purpose of Today's Talk

Some Key Life Insurance Facts From the Survey of Consumers Finances (1998)

- ▶ The life insurance participation and holding levels increase monotonically in earnings, income, and wealth.
- ▶ A comparison of the top quintile with the bottom quintile using either earnings, income, or wealth indicates that average insurance holdings are 13.4 times larger, 11.9 times larger, and 6.33 times larger, respectively.

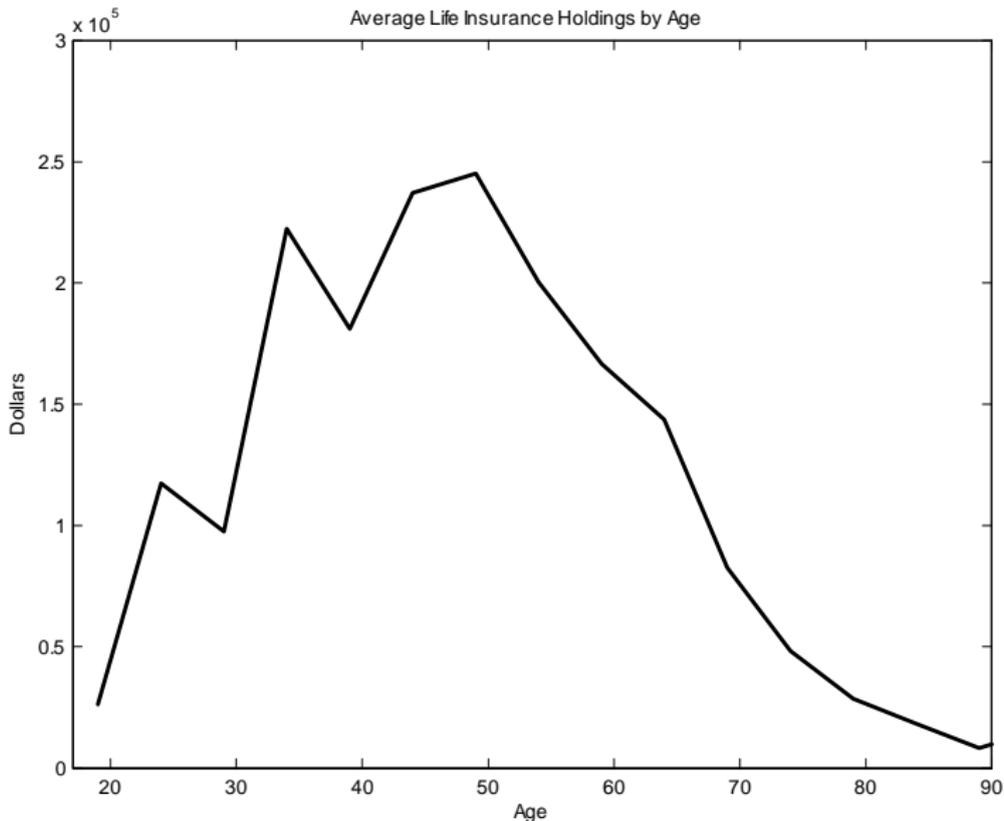
Life Insurance Facts (Continued)

- ▶ The participation rate for life insurance peaks in the late 60's.



Life Insurance Facts (Continued)

- ▶ The peak holding of life insurance occurs around age 50.



Life Insurance Facts (Continued)

- ▶ The insurance participation rate for two-worker families is 69.5 percent, while the participation rate for one-worker families is 67.7 percent.
- ▶ The average life insurance holdings of a one-worker family exceeds the two-worker family by \$6,338. Compared to a two-worker family, a one-worker family has essentially equal earnings, income, and wealth.
- ▶ The average single female widow has \$27,746 lower earnings, \$27,000 less income, and \$161,610 less wealth compared to the average one-worker family.

I) The Model Economy

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Some additional Assumptions for the Demographic Transition Matrix

- ▶ With divorce, the household splits into two households and a fixed sharing rule is assumed.
- ▶ Any children in a divorce are assigned to the female.
- ▶ If both parents die in a given period, the children also disappear.
- ▶ Individuals are only allowed to marry someone of the same age.
- ▶ If a male and a female both have children, they can only marry if the number of children is less than four.

What is the Result of these Assumptions?

Demographics of the Simulated Economy

Characteristic	Percent of Population
Married	68.0
Single	31.9
Divorced	14.4
Widowed	7.3
Never Married	10.2
0 Kids	76.6
1 Kid	18.8
2 Kids	4.3
3 Kids	0.2
4 Kids	0.1

The Household

- ▶ Household utility depends on the level of consumption, male leisure and female leisure.
- ▶ Utility function

$$E_0 \sum_{t=1}^I \beta^{t-1} \frac{[C_t^\mu (T_m - h_{mt})^{\chi_t(1-\mu)} (T_f - h_{ft} - \iota x_t)^{(1-\chi_t)(1-\mu)}]^{1-\sigma} - 1}{1-\sigma}$$

- ▶ Household Consumption

$$C_t = (1_{pt} + \eta x_t)^\theta c_t$$

where

$$1_{pt} = \begin{cases} 1, & \text{if single} \\ 2, & \text{if married} \end{cases}$$

► Labor-leisure Decision

$$h_m \in \mathcal{H}_m = \{0, [0.15, 0.98]\}$$

$$h_f \in \mathcal{H}_f = \{0, [0.15, 0.98 - \iota x]\}$$

Household Environment

- ▶ The household state, s , depends on:
 - ▶ a - beginning of period wealth position
 - ▶ ϵ - household specific productivity shock
 - ▶ p - adult structure
 - ▶ m - marital status
 - ▶ x - number of children
 - ▶ i - age of adult members
- ▶ Labor Income

$$H = (1 - 1_{\omega})(1 - \tau)w\epsilon v_i(h_m + \phi h_f) + 1_{\omega}\omega + 1_{\varphi}\varphi$$

Household Environment

(Continued)

- ▶ Budget Constraint

$$c + k' + ql' \leq a + H$$

- ▶ Wealth Evolution Equations

- ▶ Family remains the same.

$$a' \leq (1 + r')k'$$

- ▶ Divorce

$$a'_m \leq \rho(1 + r')k', \quad a'_f \leq (1 - \rho)(1 + r')k'$$

- ▶ Death of Spouse

$$a' \leq (1 + r')k' + l$$

- ▶ Married

$$a' \leq (1 + r')(k' + k'_{si}); k_{si} \text{ age-dependent average capital for a single}$$

- ▶ Inequality Constraints

$$k', l' \geq 0$$

Household Environment

(Continued)

- ▶ Aggregate Production Technology

$$Y = K^\alpha N^{1-\alpha}$$

- ▶ Profit Maximization of the Representative Agent Firm

$$r = \alpha K^{\alpha-1} N^\alpha - \delta$$

$$w = (1 - \alpha) K^\alpha N^{-\alpha}$$

- ▶ Aggregate Labor and Capital

$$N = \int_{\mathcal{A} \times \mathcal{E}} \sum_{\mathcal{P} \times \mathcal{M} \times \mathcal{X} \times \mathcal{I}} \epsilon v_i (h_m(\cdot) + \phi h_f(\cdot)) \Gamma(da, d\epsilon, p, m, x, i)$$

$$K = \int_{\mathcal{A} \times \mathcal{E}} \sum_{\mathcal{P} \times \mathcal{M} \times \mathcal{X} \times \mathcal{I}} a \Gamma(da, d\epsilon, p, m, x, i)$$

- ▶ Goods Market Clearing

$$C + I + G = Y$$

The Life Insurance Firm

- ▶ The Life Insurance Market is a perfectly competitive market
- ▶ The zero profit condition

$$\int_{\mathcal{A} \times \mathcal{E}} \sum_{\mathcal{P} \times \mathcal{M} \times \mathcal{X} \times \mathcal{I}} (1 - \psi_{p,m,x,i}) \frac{1}{1+r'} l' \Gamma(da, d\epsilon, p, m, x, i) =$$

$$\int_{\mathcal{A} \times \mathcal{E}} \sum_{\mathcal{P} \times \mathcal{M} \times \mathcal{X} \times \mathcal{I}} q(p, m, x, i) l' \Gamma(da, d\epsilon, p, m, x, i) q(p, m, x, i) l' \Gamma(da,$$

I) Model Parameterization

► Calibrated Parameters

Calibration		
Parameter	Value	Target
r	0.116	Market Clearing Eq.
β	1.005	(Wealth/GDP)=3.0
μ	0.310	(Hours Worked/Time Endo.)= 0.30
χ	0.575	(Female Hours/Male Hours)=0.69

Parameters Directly Set

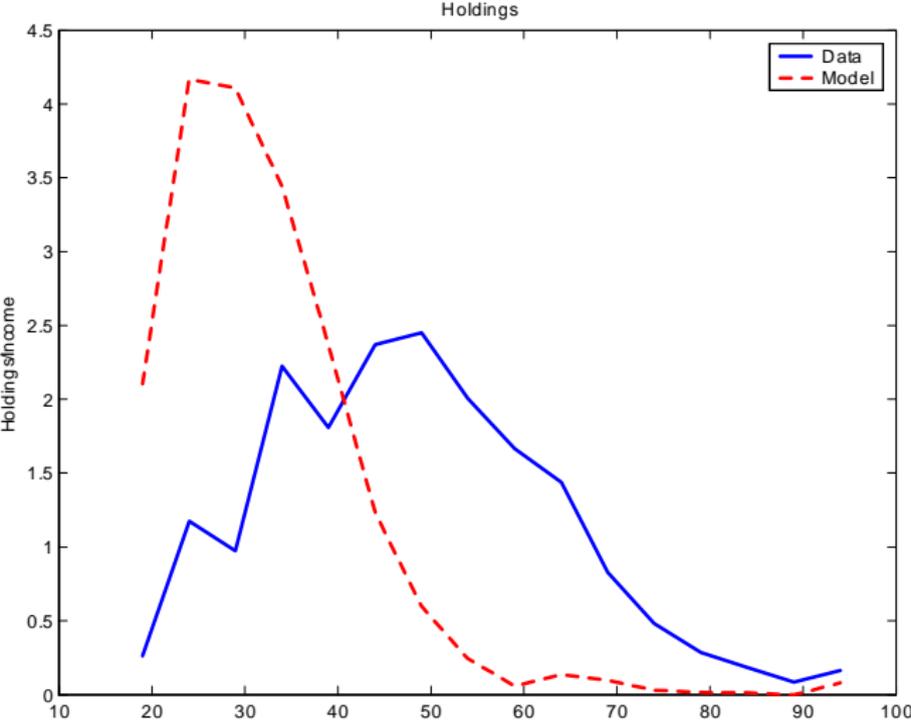
τ Parameter	Value	Source
ι	0.15	Time Use Survey
ϕ	0.77	1999 CPS
ρ	0.50	From No Fault Divorce States
η	0.30	Greenwood, Guner, and Knowles(2001)
θ	-0.50	Greenwood, Guner, and Knowles(2001)
σ	1.50	From RBC Literature
α	0.36	Capital share of National Income
δ	0.10	Investment/GDP ratio =0.30
Ψ	0.93	Fernández-Villaverde and Krueger(2000)
σ_{ϵ}^2	0.01	Fernández-Villaverde and Krueger(2000)
σ_v^2	0.06	Fernández-Villaverde and Krueger(2000)
	65	Mandatory Retirement Age
τ	0.353	Ave. Marginal Rate on Income, Payroll and
	0.40	Social Security benefits as a fraction of earnings
	0.60	Survivor Benefits as fraction of Deceased Partner'
	0.17	Welfare Benefits as fraction of average earnings p

I) Model Evaluation

Does the Model Fit the Facts under Actuarially-Fair Pricing?

- ▶ Actuarially-Fair Pricing means the price of life insurance is equal to the conditional probability that one adult member of the household does not survive to the next period.
- ▶ The wealth distribution is broadly consistent with the data (Gini = 0.74), except at the upper tail of the income distribution.
- ▶ The ratio of average to peak consumption, labor supply, and wealth match the data

Distribution of Life Insurance by Age



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- ▶ The peak holdings occur at age 30, while data says peak should be at age 50.
- ▶ The peak in the model coincides with the peak in the present value of (average) future labor earnings.
- ▶ Given rising values for future earnings and the liquidity constraint, the key is using life insurance as a consumption-smoothing device.