Rethinking the Welfare State

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NBER Submission — Research Group on Macro Public Finance

Motivation

- Inequality of earnings along the life-cycle
  - household structure – married vs. single households, single male vs. single female
- Inequality in earnings versus inequality of consumption over the life-cycle
  - Why? Shock structure, household labor supply, public policy
- The role of public policy
  - Progressive taxation
  - Social Security
  - Means-tested tax credits – Earned Income Tax Credit, Child Tax Credit
  - Means-tested transfers – AFDC/TANF, Food Stamps, SSI, Housing, Medicaid

- Aiyagari-Bewley-Huggett economies
  - Models with heterogeneity
  - Agents (typically households with one earner) face idiosyncratic productivity shocks.
  - Given these shocks, agents decide how much to consume, how much to save, how much to work to smooth consumption.
  - Agents face borrowing constraints
  - Labor supply and savings allow agents to smooth their consumption.
  - Public policies also help agents to smooth consumption
- How well agents are able to smooth their consumption?
- What are the role of policy and household decisions?
- Judge the extent of insurance looking at the inequality in earnings versus inequality of consumption over the life-cycle
  - individual earnings data vs. household level consumption data

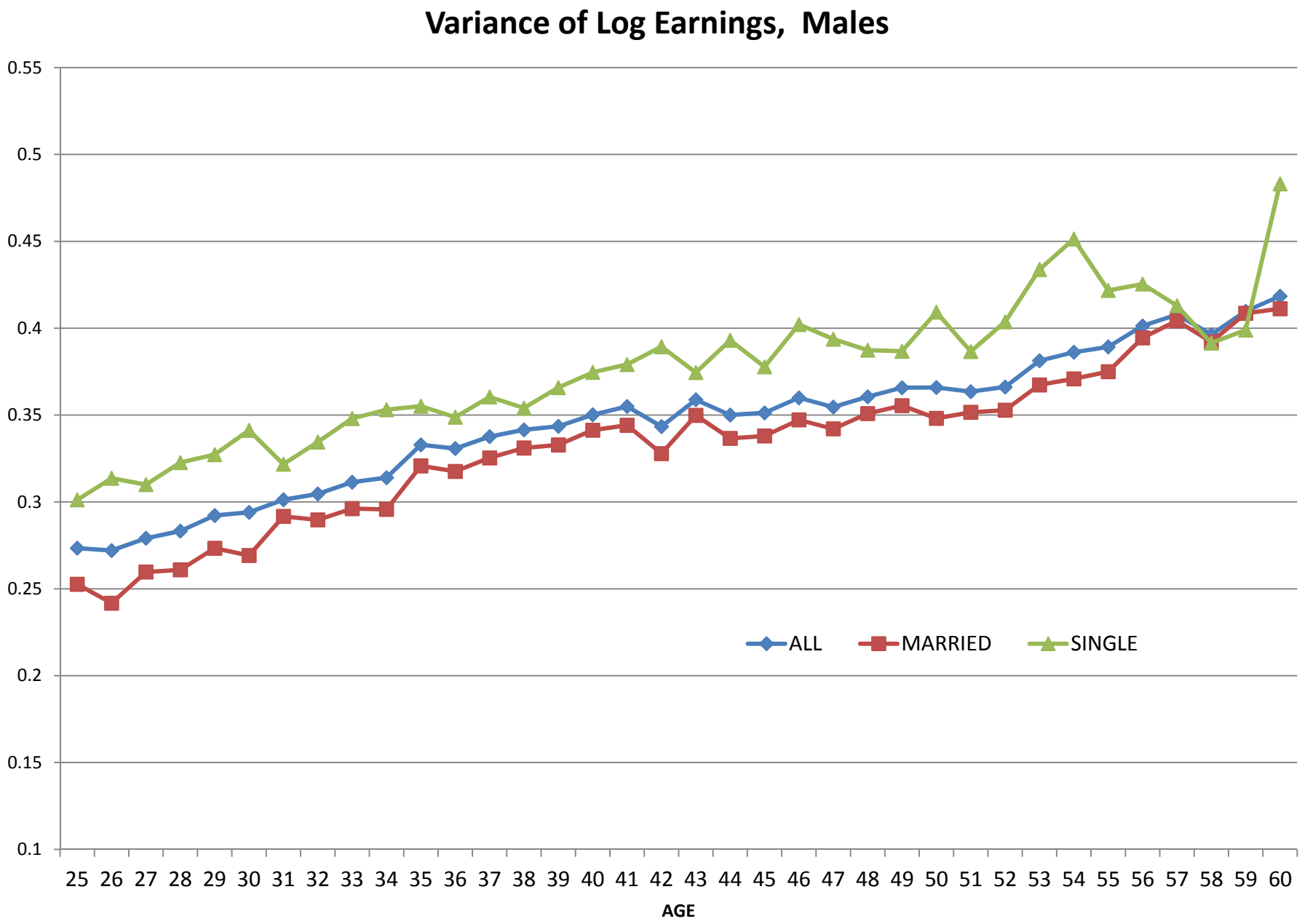
What we do

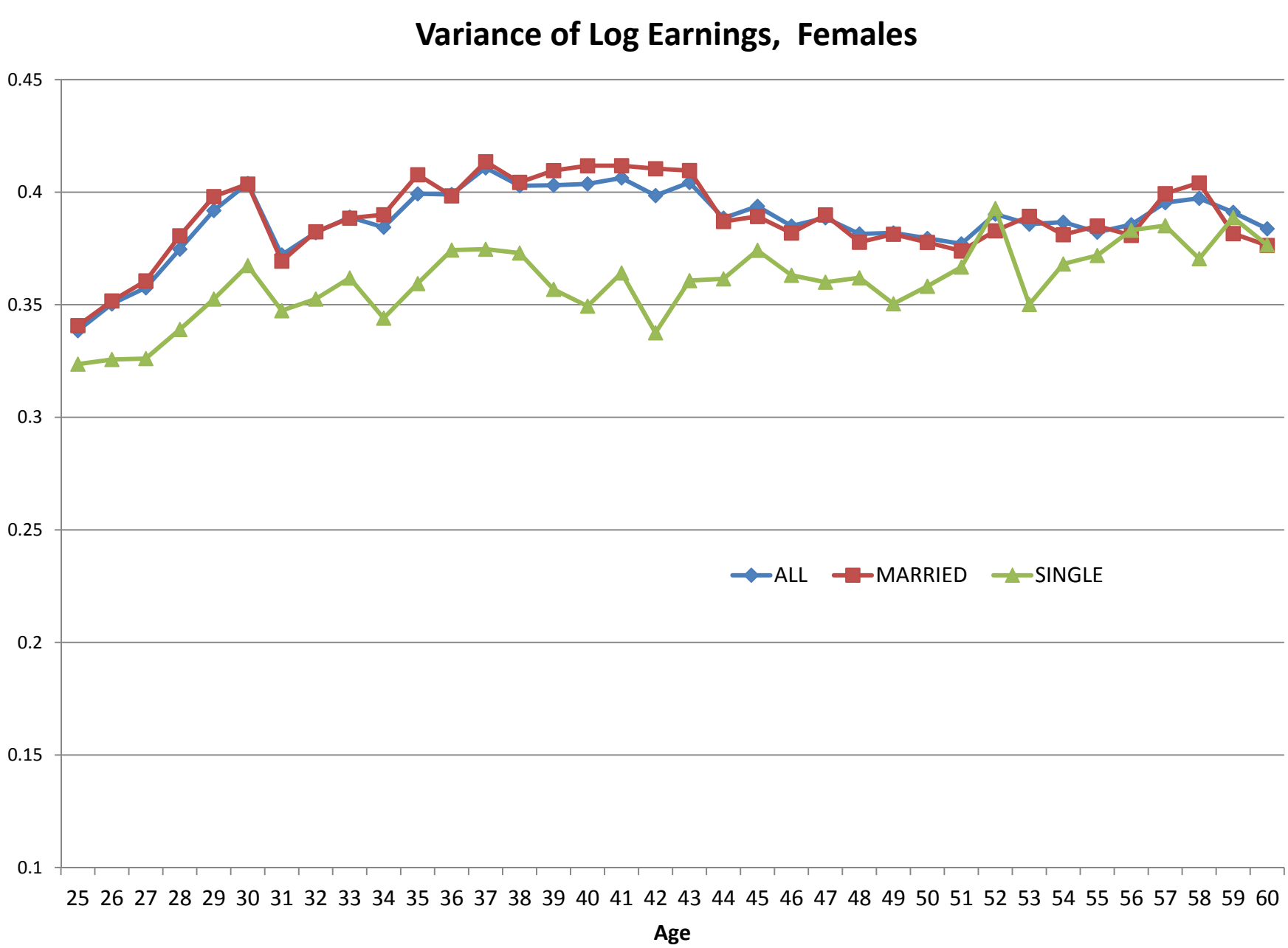
- Documents facts on inequality in earnings and consumption along the life-cycle for *different types of individuals and households*
- Develop a life-cycle economy that has the *potential* to account for these facts
  - heterogenous married and single agents
  - facing idiosyncratic productivity shocks
  - household labor supply decisions at intensive and extensive margins
  - progressive taxation of household incomes
  - means-tested tax benefits
  - means-tested transfers
- Use this framework to evaluate quantitatively a system that replaces current *taxes and transfers* with
  - Proportional income tax
  - Negative income tax

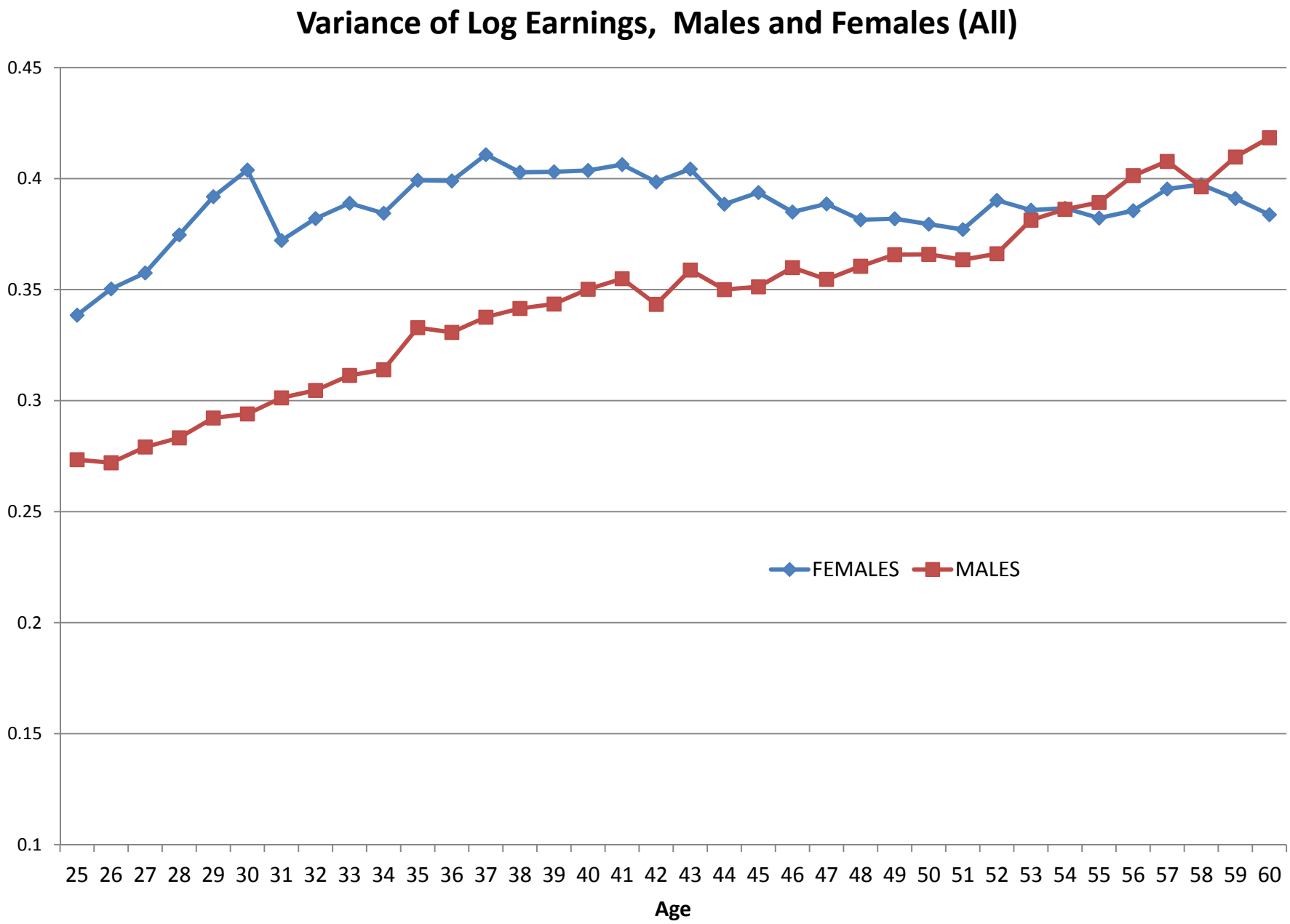
- Current Population Survey (CPS)
  - Household heads and their spouses between ages 25 to 50
  - Drop all top-coded income variables
  - Drop all observations with hourly wage that is less than federal minimum wage
  - Drop if yearly hours is less than 520 hours per year for those above age 30, less than 260 for those below age 30, and all observations more than 5820 hours of work
  - For each individual and household calculate total earnings. Trim bottom 5%
- Estimate

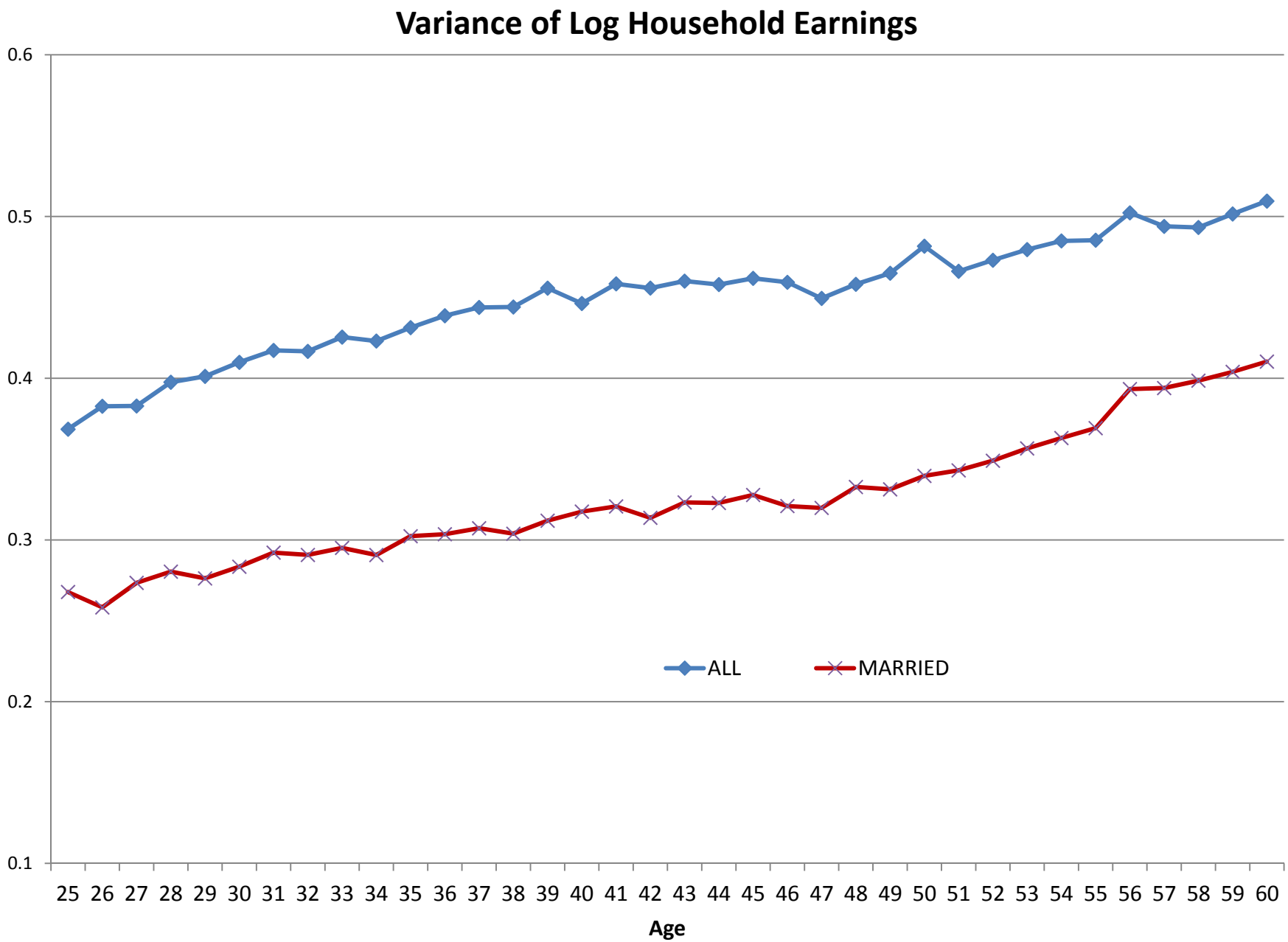
$$m_{a,t} = \beta_a' \mathbf{D}_a + \beta_t' \mathbf{D}_t + \varepsilon_{a,t}$$

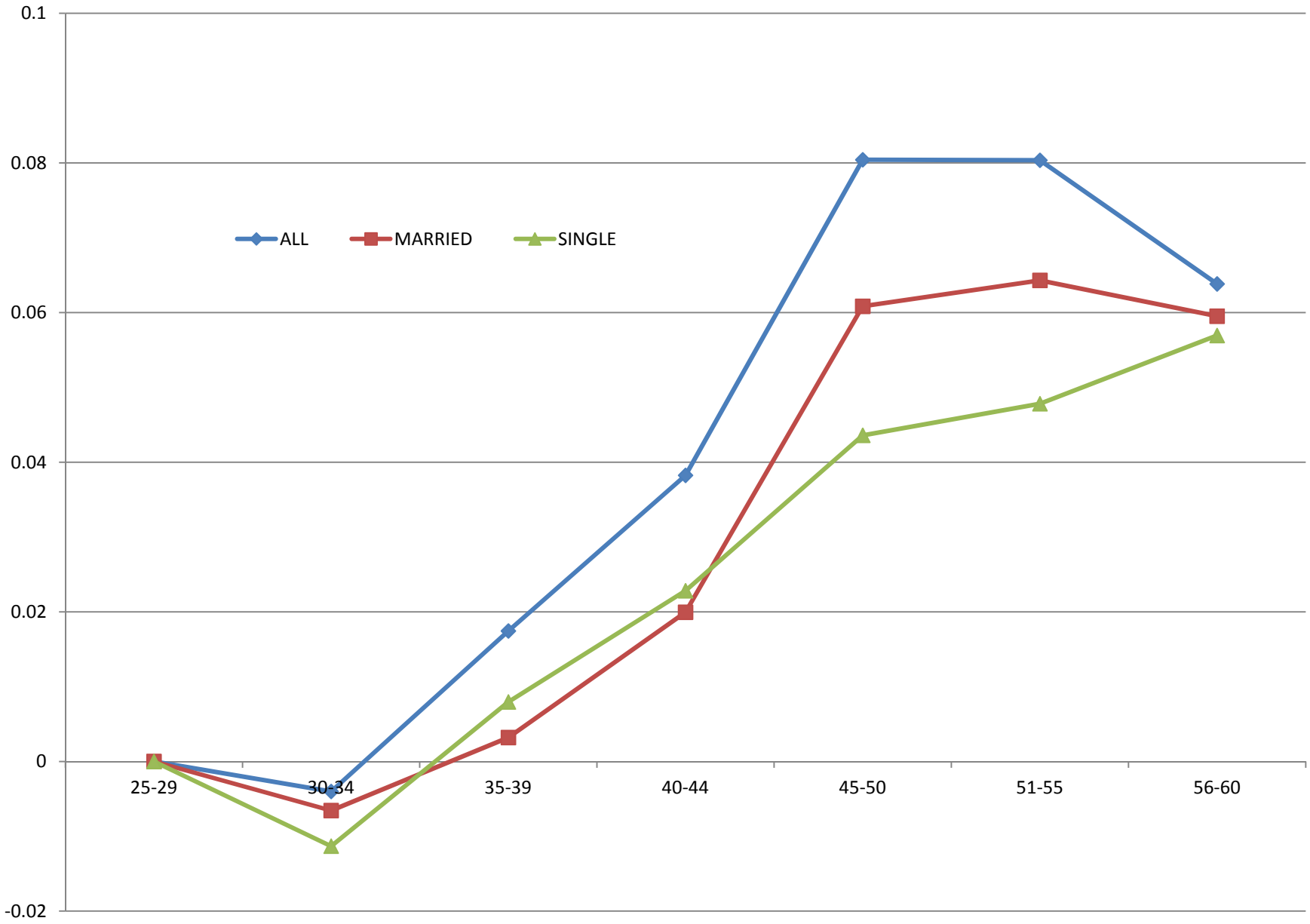
- Consumption Expenditure Survey (CEX)
  - Compute total non-durable consumption expenditure
- Huggett, Ventura and Yarom (2010), Heathcote, Perri and Violante (2010)

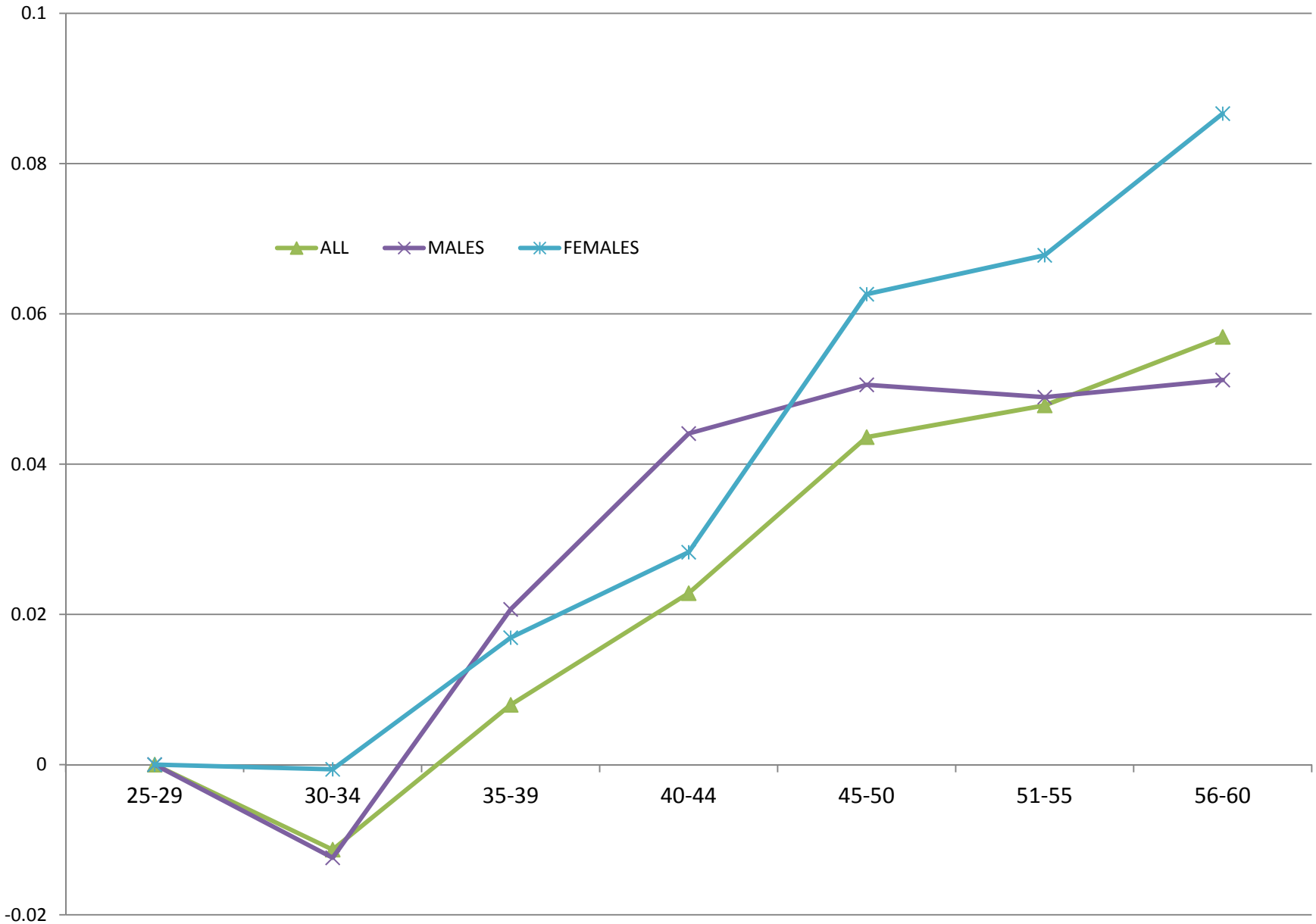

Variance of Log Earnings, Males
0.55
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
ALL
MARRIED
SINGLE
25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60
AGE

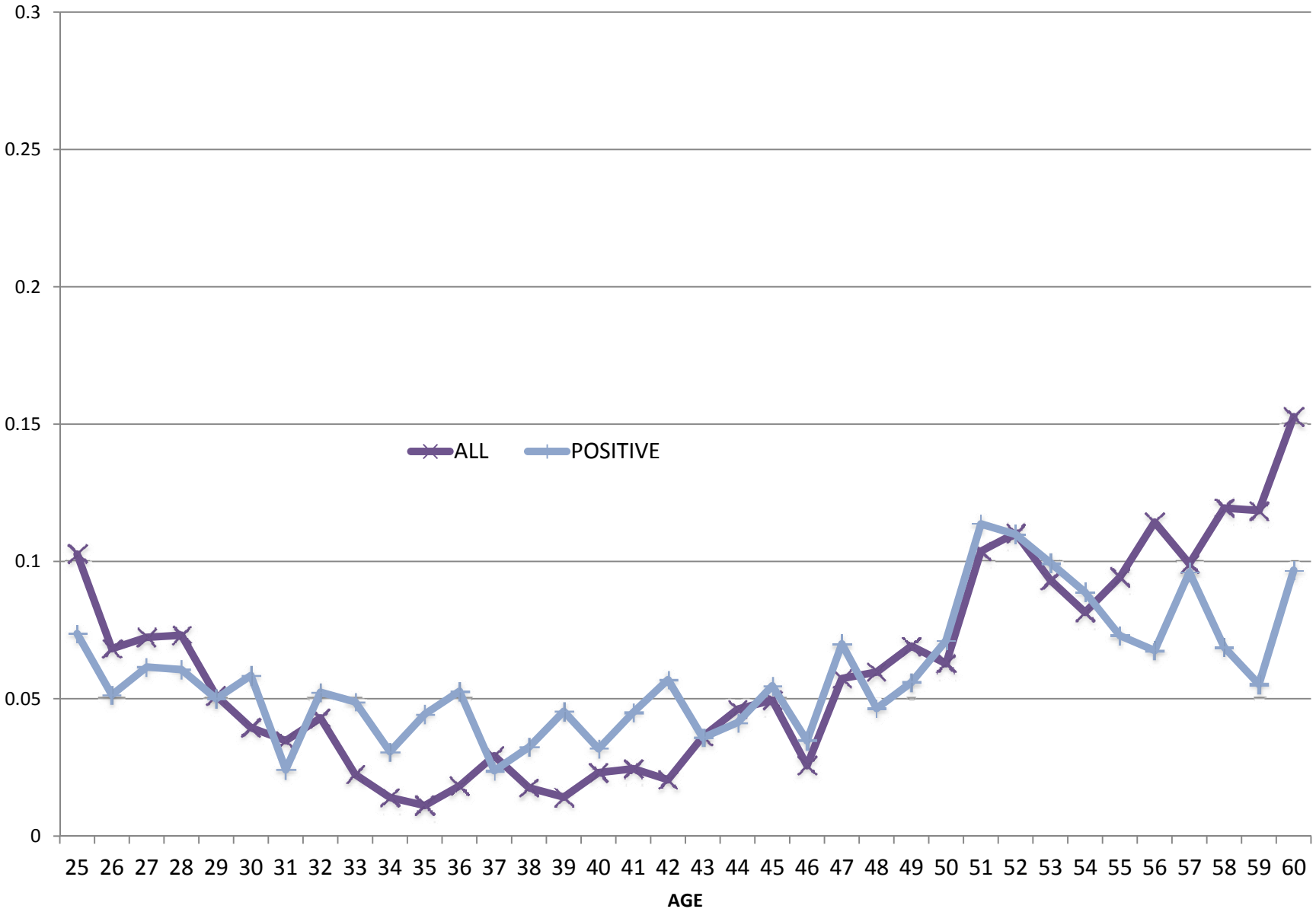

Variance of Log Earnings, Females
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
ALL
MARRIED
SINGLE
25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60
Age

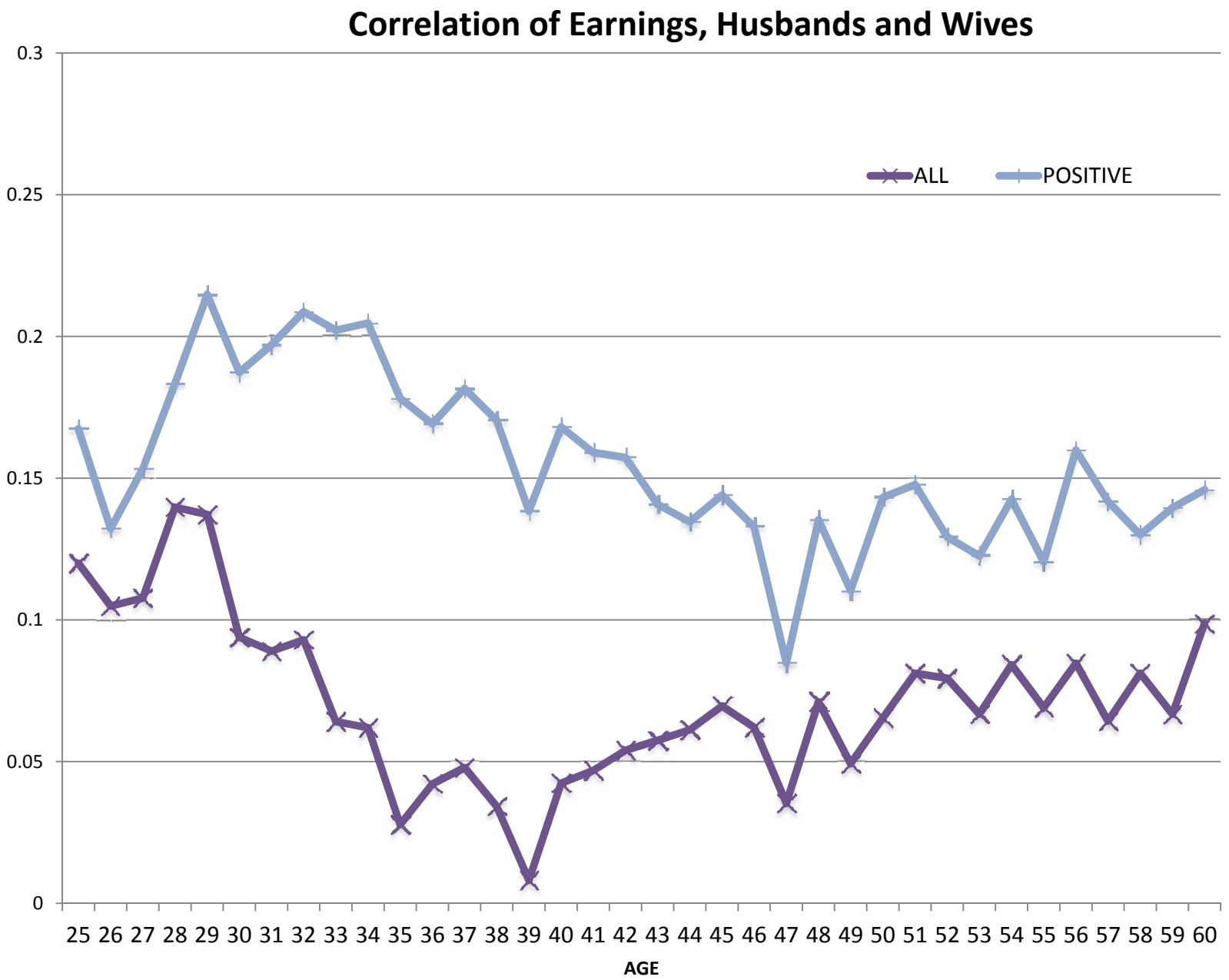

Variance of Log Earnings, Males and Females (All)
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
FEMALES
MALES
25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60
Age


Variance of Log Household Earnings
0.6
0.5
0.4
0.3
0.2
0.1
ALL
MARRIED
25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60
Age


Variance of Log Consumption
0.1
0.08
0.06
0.04
0.02
0
-0.02
ALL
MARRIED
SINGLE
25-29
30-34
35-39
40-44
45-50
51-55
56-60


Variance of Log Consumption, Single Households
0.1
0.08
0.06
0.04
0.02
0
-0.02
ALL
MALES
FEMALES
25-29
30-34
35-39
40-44
45-50
51-55
56-60


Correlation of Hours, Husband and Wives
0.3
0.25
0.2
0.15
0.1
0.05
0
ALL
POSITIVE
25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60
AGE


Correlation of Earnings, Husbands and Wives
0.3
0.25
0.2
0.15
0.1
0.05
0
ALL
POSITIVE
25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60
AGE

Facts

- For males, married or single, variance of log earnings increase non-trivially along the life-cycle.
- For females, married or single, we *do not observe* such increase.
- For both married and single households variance of log earnings increase non-trivially along the life-cycle.
  - The level of inequality is *much lower* for married households.
- The variance of log consumption increases along the life-cycle.
  - But *much less than* the increase in the variance of household earnings.
- The correlation between earnings of husbands and wives is low and slightly U-shaped along the life–cycle.
- The correlation between hours of husband and wives is low and slightly U-shaped along the life-cycle.

Model – Demographics and Heterogeneity

- Life-cycle economy, $j = 1, ..., J_R, ...J$. [25,26,.....,65,.....,80]
- Males (m) and females (f), differ in their types/education.
  - Male types, $z \in Z$. Map into productivity profiles, $\varpi_m(z, j)$.
  - Female types, $x \in X$. Map into initial productivity levels, $h_1 = \eta(x)$, and after age 1, h evolves endogenously.
- Agents can be single or married.Marital status is exogenous, and does not change over the life-cycle.

Model – Demographics and Heterogeneity

- Married households and single females differ in terms of the number of children attached to them.
  - Three possibilities: *without*, *early*, *late*
- If a female with children works, married or single, then the household has to pay for child care costs.
- Young (age 1) children imply a time cost for mothers, $\varkappa$
  - Children do not provide any utility.
- Joint market work for married couples also implies a utility cost, q
  - *Residual heterogeneity* in labor force participation.

Model – Human Capital Accumulation for Females

- Female types, $x \in X$. These types map into initial productivity levels, $h_1 = \eta(x)$, and after age 1, h evolves endogenously.

- After age 1, labor market productivity of females evolves endogenously – Attanasio, Low, Sanchez-Marcos 2008

$$h' = \exp[\ln h + \underbrace{\alpha_j^x}_{\text{growth}} \chi(l) - \underbrace{\delta}_{\text{dep.}}(1 - \chi(l))],$$

where $\chi(l)$ is an indicator function for $l > 0$ (hours worked by females).

- In the current simulations, $\delta = 0$.
- Given costs (children and utility cost of joint work) and benefits (earnings plus human capital accumulation), females decides whether to work or not.

Model – Idiosyncratic Productivity Shocks

- Note that agents differ by their types (education)
- For an age-j single male of type z, earnings are given by

$$\underbrace{w}_{\text{wage}} * \underbrace{\varpi(j,z) * \exp(\eta_j^{s,m})}_{\text{labor endowment}} * \underbrace{l_m}_{\text{labor supply}},$$

  where $\varpi(z,j)$ is the age-earning profile given z, $\eta_j^{s,m}$ is a *persistent shock*.
- For $j > 1$, the persistent shock is governed by an AR(1) process

$$\eta_{j+1}^{s,m} = \rho_{s,m}\eta_j^{s,m} + \varepsilon_{j+1}^{s,m},$$

  with $\varepsilon_{j+1}^{s,m} \sim N(0, \sigma^2_{\varepsilon^{s,m}})$.
- The initial value at the start of the life cycle is a draw from a normal distribution. Hence,

$$\eta_1^{s,m} \sim N(0, \sigma^2_{\eta_1^{s,m}})$$

Model – Idiosyncratic Productivity Shocks

- For a single female of age-j who has human capital h_j, earnings are given by

$$\underbrace{w}_{\text{wage}} * \underbrace{h_j * \exp(\eta_j^{s,f})}_{\text{labor endowment}} * \underbrace{l_f}_{\text{labor supply}}$$

- For $j > 1$, let

$$\eta_{j+1}^{s,f} = \rho_{s,f}\eta_j^{s,f} + \varepsilon_{j+1}^{s,f}$$

with $\varepsilon_{j+1}^{s,f} \sim N(0, \sigma^2_{\varepsilon^{s,f}})$.

- Again, the initial value at the start of the life cycle is a draw from a normal distribution. Hence,

$$\eta_1^{s,f} \sim N(0, \sigma^2_{\eta_1^{s,f}})$$

Model – Idiosyncratic Productivity Shocks

- Married couples

$$w * \underbrace{h_j * \exp(\eta_j^{m,f})}_{\text{labor endowment}} * w * l_f + w * \underbrace{\omega(j,z) * \exp(\eta_j^{m,m})}_{\text{labor endowment}} * l_m,$$

- For $j > 1$, the bivariate AR(1) process is

$$\eta_{j+1}^{m,m} = \rho_{m,m}\eta_j^{m,m} + \varepsilon_{j+1}^{m,m} \text{ and } \eta_{j+1}^{m,f} = \rho_{m,f}\eta_j^{m,f} + \varepsilon_{j+1}^{m,f}$$

with

$$(\varepsilon_{j+1}^{m,m}, \varepsilon_{j+1}^{m,f}) \sim N\left(\begin{array}{c} 0 \\ 0 \end{array}, \begin{array}{cc} \sigma^2_{\varepsilon^{m,m}} & \sigma_{\varepsilon^f \varepsilon^m} \\ \sigma_{\varepsilon^f \varepsilon^m} & \sigma^2_{\varepsilon^{f,f}} \end{array} \right),$$

- Initial values for persistent shocks for couples are draws from a bivariate normal distribution, with correlation. Therefore,

$$(\eta_1^{m,m}, \eta_1^{m,f}) \sim N\left(\begin{array}{c} 0 \\ 0 \end{array}, \begin{array}{cc} \sigma^2_{\eta_1^{m,m}} & \sigma_{\eta_1^m \eta_1^f} \\ \sigma_{\eta_1^m \eta_1^f} & \sigma^2_{\eta_1^{f,f}} \end{array} \right)$$

Model – Idiosyncratic Productivity Shocks

- Parameters (persistence, innovation, initial shocks)
  - Single males: $\rho_{s,m}$, $\sigma^2_{\varepsilon^{s,m}}$, $\sigma^2_{\eta_1^{s,m}}$
  - Single females: $\rho_{s,f}$, $\sigma^2_{\varepsilon^{s,f}}$, $\sigma^2_{\eta_1^{s,f}}$
  - Married : $\rho_{m,m}$, $\rho_{m,f}$, $\sigma^2_{\varepsilon^{m,f}}$, $\sigma^2_{\varepsilon^{m,m}}$, $\sigma^2_{\varepsilon^f \varepsilon^m}$, $\sigma^2_{\eta_1^{m,m}}$, $\sigma^2_{\eta_1^{m,f}}$, $\sigma^2_{\eta_1^m \eta_1^f}$
- For now, we assume that $\rho_{s,m} = \rho_{s,f} = \rho_{m,m} = \rho_{m,f} = \rho$.
- For now, also assume that $\sigma^2_{\varepsilon^{s,m}} = \sigma^2_{\varepsilon^{s,f}} = \sigma^2_{\varepsilon^{m,m}} = \sigma^2_{\varepsilon^{m,f}} = \sigma^2_{\varepsilon}$.
- Parameters: $\{\rho, \sigma^2_{\varepsilon}, \sigma_{\varepsilon^f \varepsilon^m}, \sigma^2_{\eta_1^{s,m}}, \sigma^2_{\eta_1^{s,f}}, \sigma^2_{\eta_1^{m,m}} = \sigma^2_{\eta_1^{m,,f}}, \sigma_{\eta_1^m \eta_1^f})$

- Single female

$$U_f^S(c, l, k_y) = \log(c) - B(l + \underbrace{k_y \varkappa}_{\text{time cost}})^{1+\frac{1}{\gamma}},$$

where $k_y \in \{0, 1\}$ is an indicator for young (age-1) children.

- Single male

$$U_m^S(c, l) = \log(c) - B(l)^{1+\frac{1}{\gamma}}.$$

- Married female

$$U_f^M(c, l_f, q, k_y) = \log(c) - B(l_f + k_y \varkappa)^{1+\frac{1}{\gamma}} - \underbrace{\frac{1}{2}\chi\{l_f\}q}_{\text{utility cost}},$$

- Married male

$$U_m^M(c, l_m, l_f, q) = \log(c) - B l_m^{1+\frac{1}{\gamma}} - \frac{1}{2}\chi\{l_f\}q.$$

Note: $\gamma = 0.4$ is same for males and females.

- Income tax functions $T^M(I,k)$ and $T^S(I,k)$
  - These functions are continuous in I, increasing and convex.
  - k is an indicator for children Tax functions

$$average\ tax\ rate\ (income) = \eta_1 + \eta_2 \log(income) + \varepsilon,$$

- We estimate these functions from Internal Revenue Service (IRS) micro data – Guner, Kaygusuz and Ventura (2014)
- Besides the income and payroll taxes, each household pays an additional flat capital income tax for the returns from his/her asset holdings, τ_k.
- There is a social security system financed by a flat payroll tax, τ_p
  - Social Security payments are indexed by agents' initial types (education)

Model – Government

- Earned Income Tax Credit (EITC) and Child Tax Credit (CTC)
  - Model them exactly as they are in the tax code
- Transfers
  - Survey of Income and Program Participation (SIPP), 1995-2013
  - Estimate effective transfer functions.
  - Include AFDC/TANF, SSI, Food Stamps/SNAP, WIC
- Total transfer functions $TR^M(I,k)$ and $TR^S(I,k)$

Decision Problem – Married Households

- Let $\theta = (x, z, q, b)$

$$V^M(a, h, \eta_j^{m,f}, \eta_j^{m,m}; \theta, j) = \max_{a',\ l_f,\ l_m} \{[U_f^M(c, l_f, q, k_y) + U_m^M(c, l_m, l_f, q$$
$$+ \beta EV^M(a', h', \eta_j^{m,f'}, \eta_j^{m,m\prime}; \theta, j+1)\},$$

subject to (with kids)

$$c + a' + \underbrace{d\chi(l_f)}_{\text{child care costs}}$$
$$= a(1 + r(1 - \tau_k)) + w(\varpi_m(z, j)l_m + hl_f)(1 - \tau_p)$$
$$- \underbrace{T^M(w\varpi_m(z, j)l_m + whl_f + ra, 1)}_{\text{taxes}}$$
$$+ \underbrace{TR^M(w\varpi_m(z, j)l_m + whl_f + ra, 1)}_{\text{transfers}}$$

Quantitative Analysis - Demographics and Heterogeneity, taken from the data

- Wage profiles of males
  - Four types: less than or equal to high school (hs), some college (sc), college (col) and post-college (col+)
- Initial wages for females
  - Four types: hs, sc, col, col+
- Demographic structure
  - marital status, about 74% of people are married
  - who is married with whom, about 50% of people marry someone of their own type
  - child bearing status, high types (col or col+) are more likely to be childless or have their children late

Quantitative Analysis – Human Capital Accumulation for females

- To calibrate human capital process

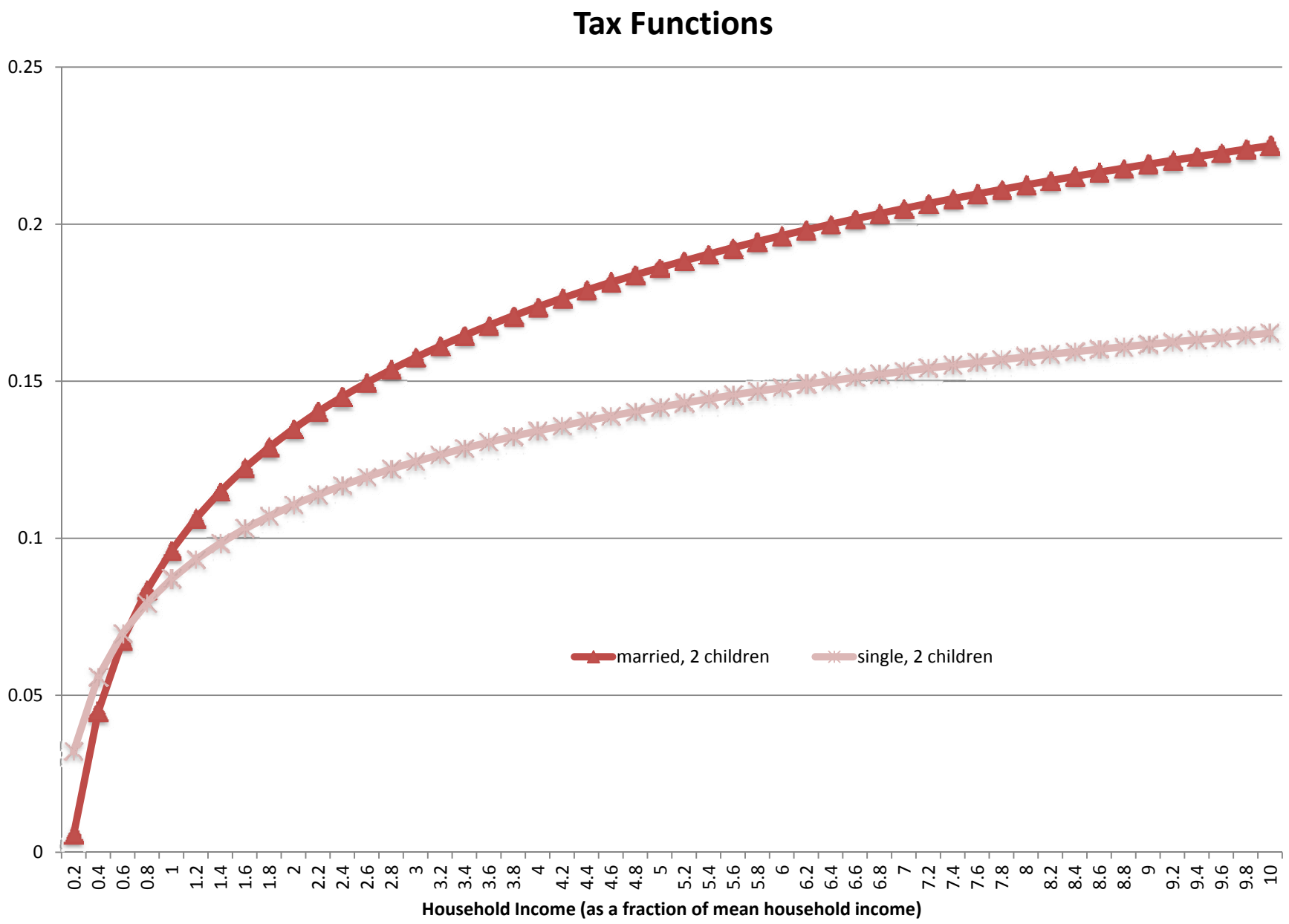
$$h' = G(x, h, l, j) = \exp\left[\ln h + \alpha_j^x \chi(l)\right].$$

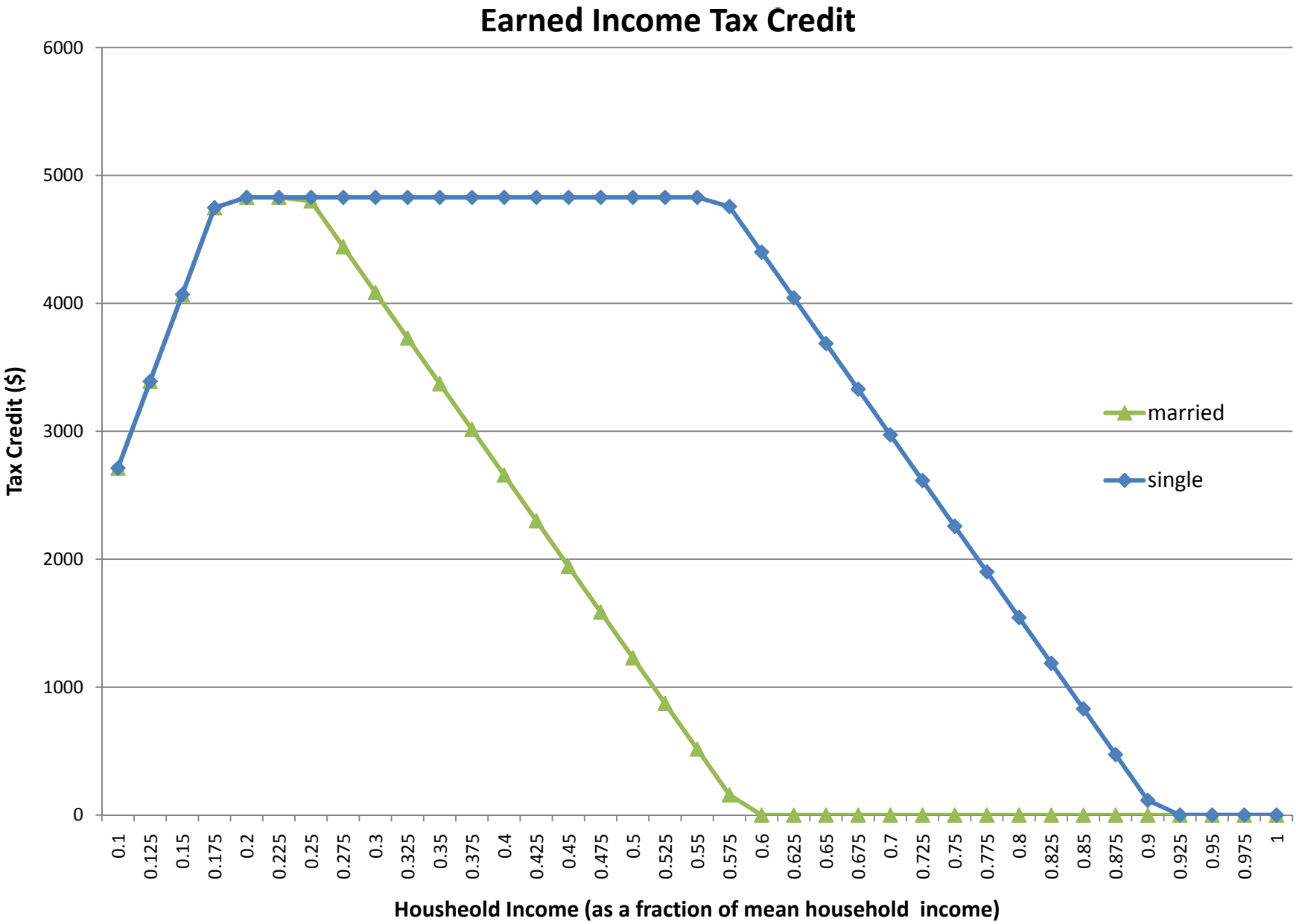
- Then, we select α_j^x so that if a female of a particular type x works in every period, her wage profile has exactly the same shape as males.
  - select these parameters before we run the model

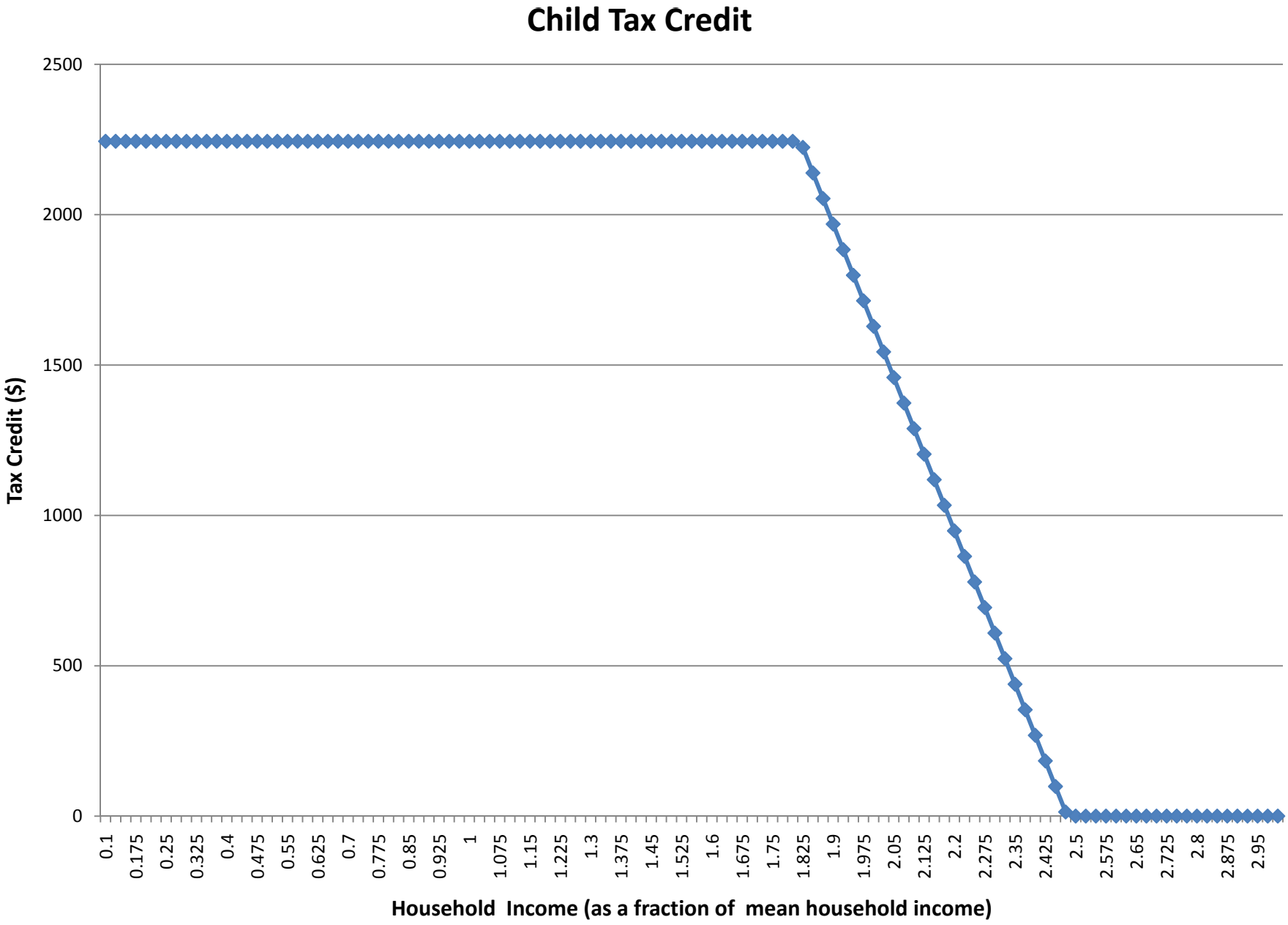
Quantitative Analysis - Preferences

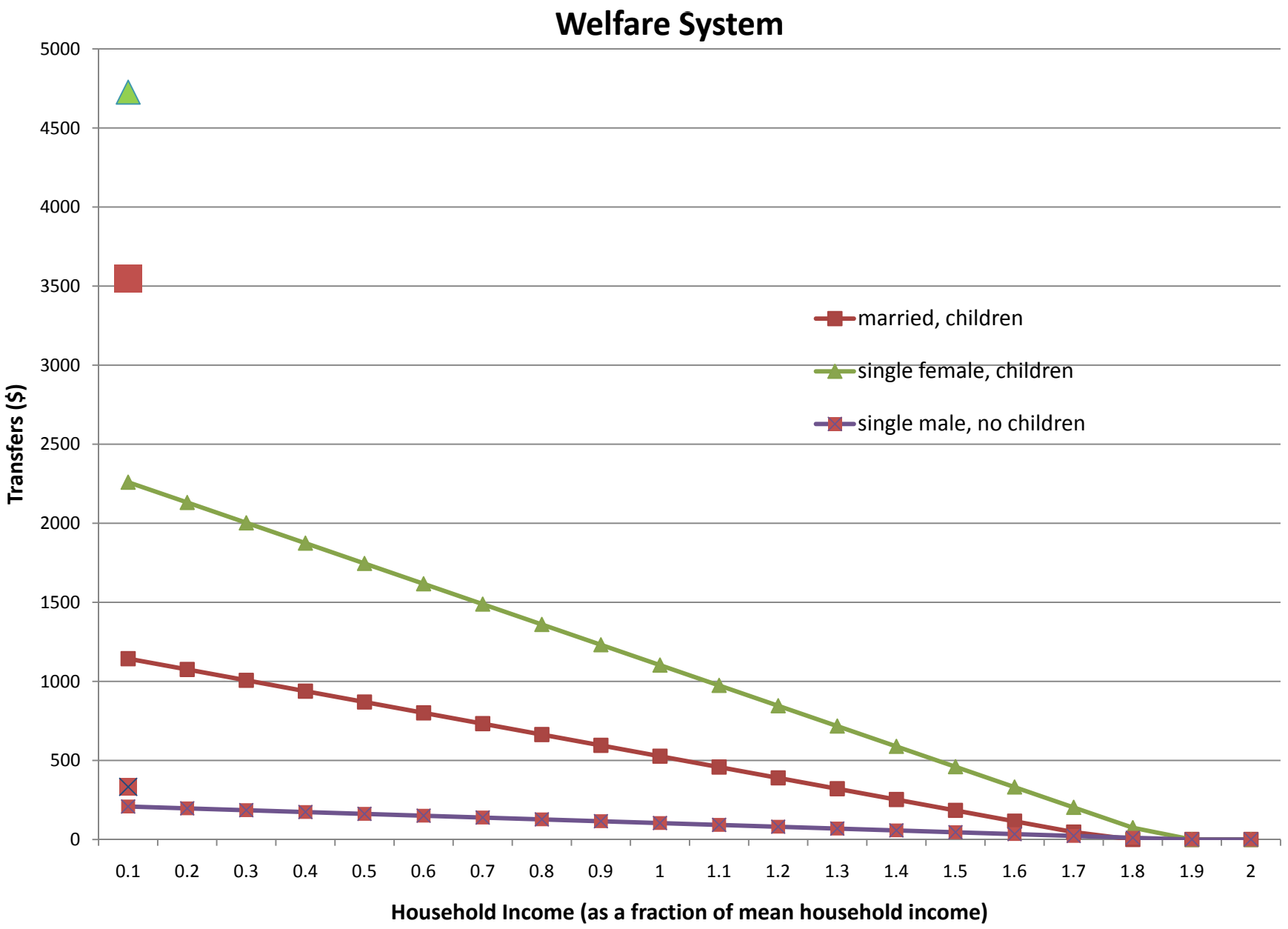
$$U_f^M(c, l_f, q, k_y) = \log(c) - B(l_f + k_y \varkappa)^{1+\frac{1}{\gamma}} - \frac{1}{2}\chi\{l_f\}q,$$

- $\gamma = 0.4$ (based on available estimates)
- B is calibrated to match the aggregate hours worked in the data.
- $\varkappa$ is calibrated to match the LFP of married females with young (0 to 5) children.
- β is chosen to match capital-to-output ratio.
- q to match female labor supply
- d (child care cost) to match spending on child care by households.


Tax Functions
0.25
0.2
0.15
0.1
0.05
0
married, 2 children
single, 2 children
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
2.2
2.4
2.6
2.8
3
3.2
3.4
3.6
3.8
4
4.2
4.4
4.6
4.8
5
5.2
5.4
5.6
5.8
6
6.2
6.4
6.6
6.8
7
7.2
7.4
7.6
7.8
8
8.2
8.4
8.6
8.8
9
9.2
9.4
9.6
9.8
10
Household Income (as a fraction of mean household income)


Earned Income Tax Credit
6000
5000
4000
3000
2000
1000
0
Tax Credit ($)
married
single
0.1
0.125
0.15
0.175
0.2
0.225
0.25
0.275
0.3
0.325
0.35
0.375
0.4
0.425
0.45
0.475
0.5
0.525
0.55
0.575
0.6
0.625
0.65
0.675
0.7
0.725
0.75
0.775
0.8
0.825
0.85
0.875
0.9
0.925
0.95
0.975
1
Housheold Income (as a fraction of mean household income)


Child Tax Credit
Tax Credit ($)
2500
2000
1500
1000
500
0
0.1
0.175
0.25
0.325
0.4
0.475
0.55
0.625
0.7
0.775
0.85
0.925
1
1.075
1.15
1.225
1.3
1.375
1.45
1.525
1.6
1.675
1.75
1.825
1.9
1.975
2.05
2.125
2.2
2.275
2.35
2.425
2.5
2.575
2.65
2.725
2.8
2.875
2.95
Household Income (as a fraction of mean household income)


Welfare System
Transfers ($)
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1.1
1.2
1.3
1.4
1.5
1.6
1.7
1.8
1.9
2
Household Income (as a fraction of mean household income)
married, children
single female, children
single male, no children

Quantitative Analysis – Shocks

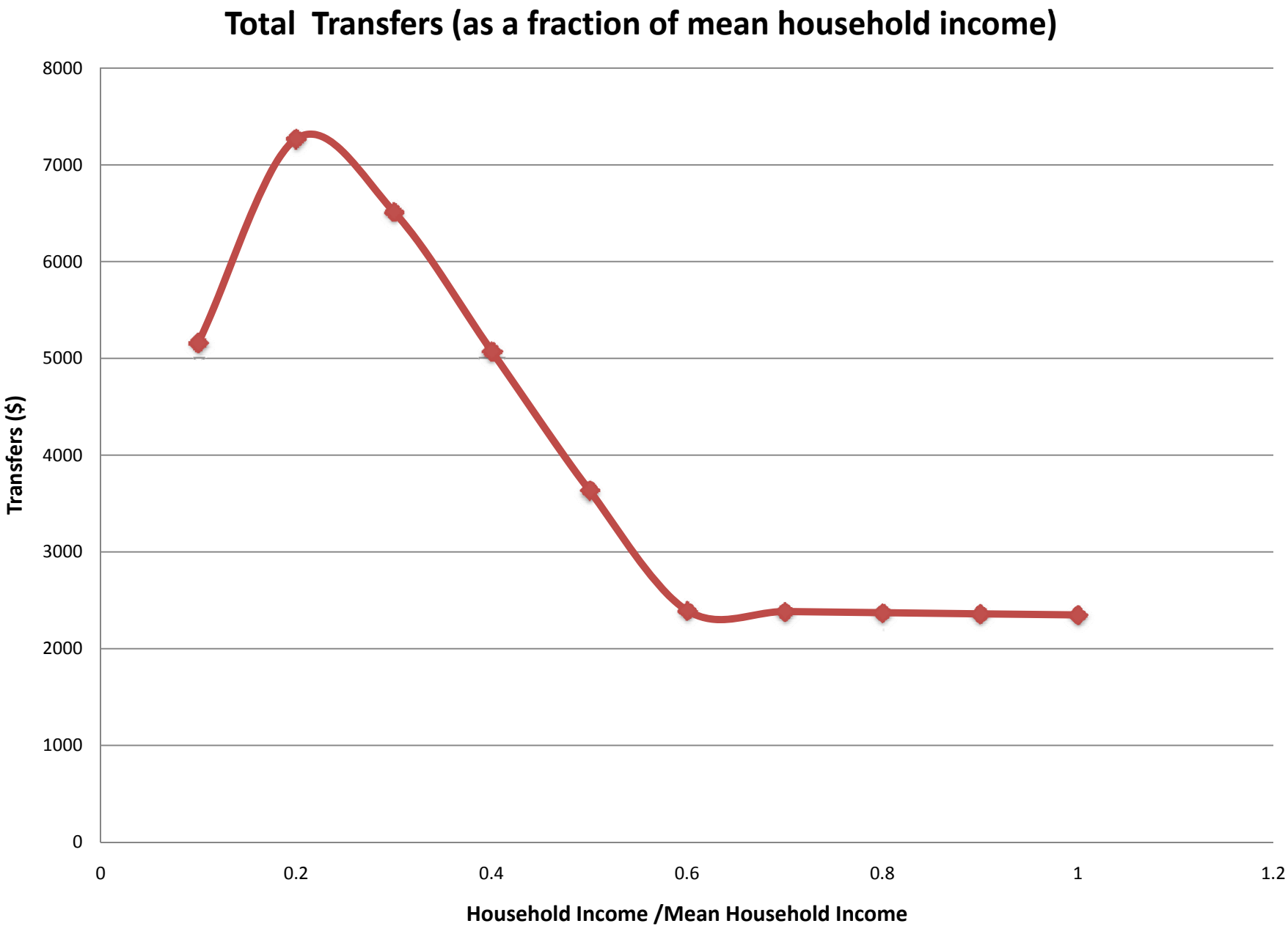
- 7 parameters: $\left\{\rho, \sigma_{\varepsilon}, \sigma_{\varepsilon^f \varepsilon^m}, \sigma_{\eta_1^{s,m}}, \sigma_{\eta_1^{s,f}}, \sigma_{\eta_1^{m,m}} = \sigma_{\eta_1^{m,f}}, \sigma_{\eta_1^m \eta_1^f}\right)$
- $\rho = 0.958$ – Kaplan (2012)
- $\sigma_{\varepsilon}^2 = 0.011$ – var. of log earnings, all males.
- $\sigma_{\varepsilon^f \varepsilon^m} = 0.034$ – corr. of earnings b/w hus. and wives, 45-54
- $\sigma_{\eta_1^{s,m}} = 0.21$ – var. of log earnings, single males, 25-29
- $\sigma_{\eta_1^{s,f}} = 0.24$ – var. of log earnings, single females, 25-29
- $\sigma_{\eta_1^{m,m}} = \sigma_{\eta_1^{m,f}} = 0.11$ — var. of earnings, married males, 25-29
- $\sigma_{\eta_1^m \eta_1^f} = 0.042$ – cor. of earnings b/w hus. and wives, 25-29

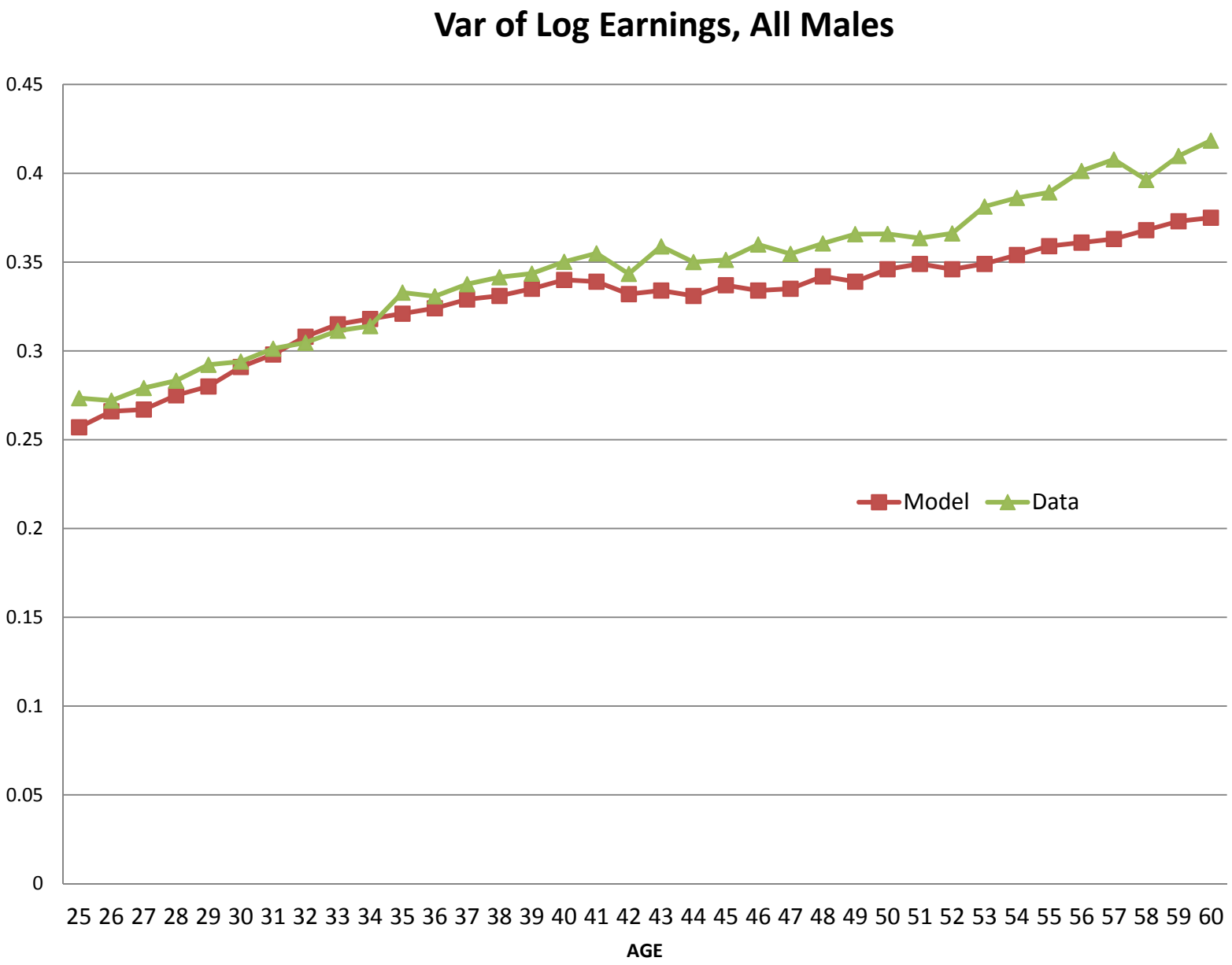
Model and Data

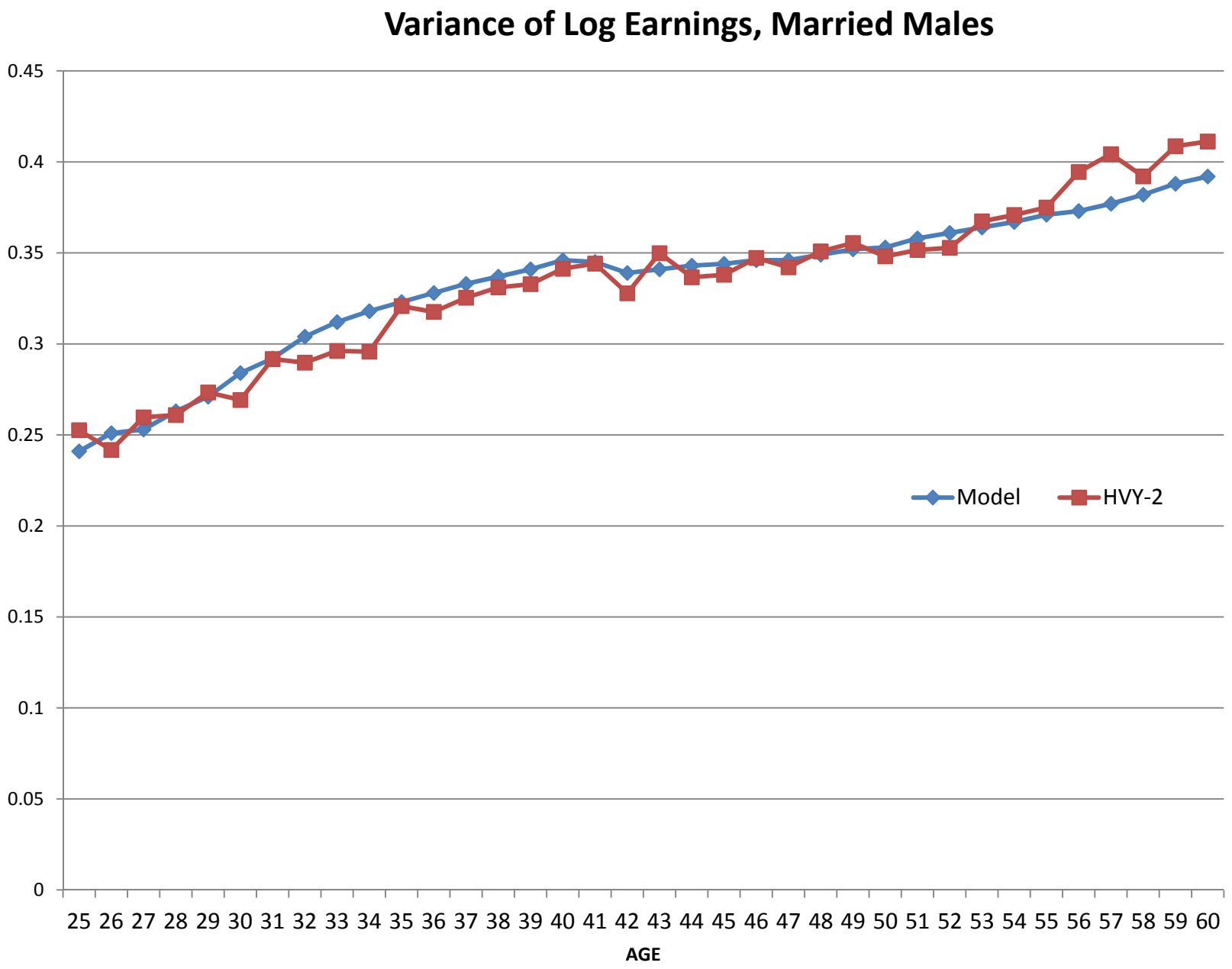
Statistic	Data	Model
Capital Output Ratio	2.93	2.97
Labor Hours Per-Worker	0.40	0.4
LFP of Married Females with Young Children (%)	62.6	60.2
LFP of Married Females (%), 25-54		
Less than High School	61.8	61.1
Some College	74.0	73.1
College	74.9	76.6
More than College	81.9	80.5
Total	72.2	70.3
With Children	68.3	66.6
Without Children	85.9	79.5

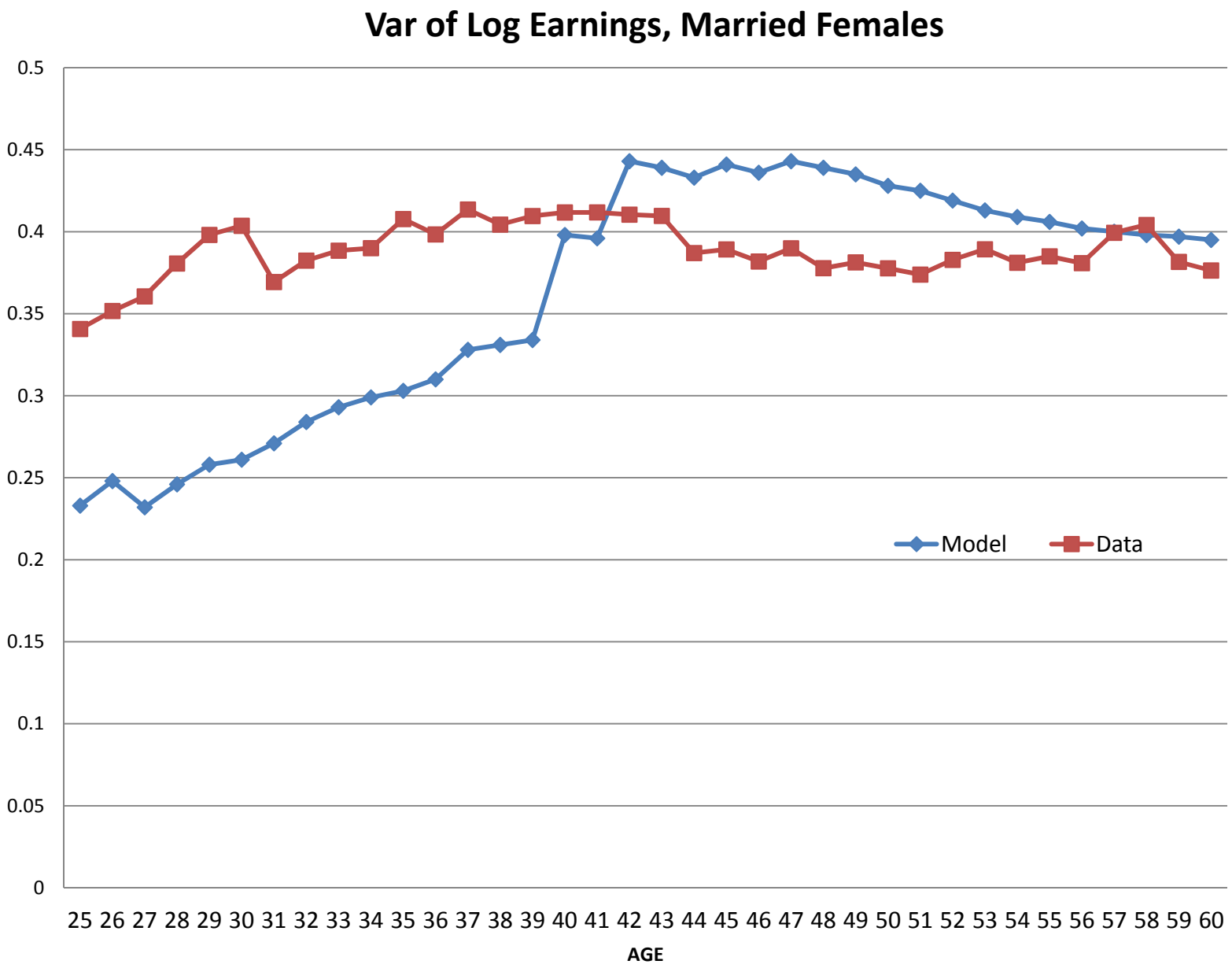
Taxes and Transfers
(households with children)

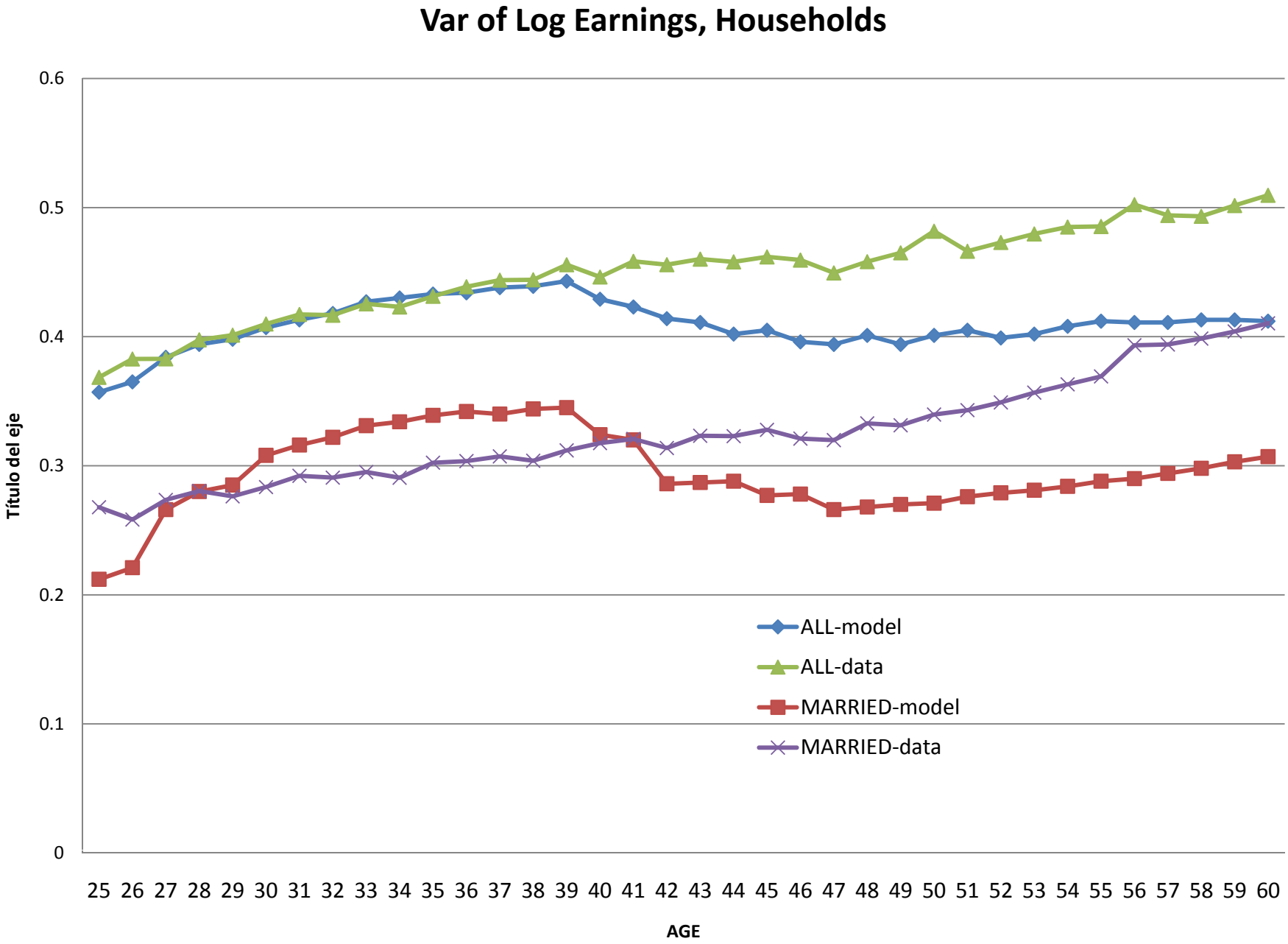
Statistic	Married	Single Female
Payment per recipient ($)		
EITC	2796	3429
CTC	2144	1848
Transfers	883	2074
Recipients		
EITC	7.7%	7.5%
CTC	31.9%	9.7%
Transfers	18.8%	8.4%
Total Spending/GDP	1.2%	

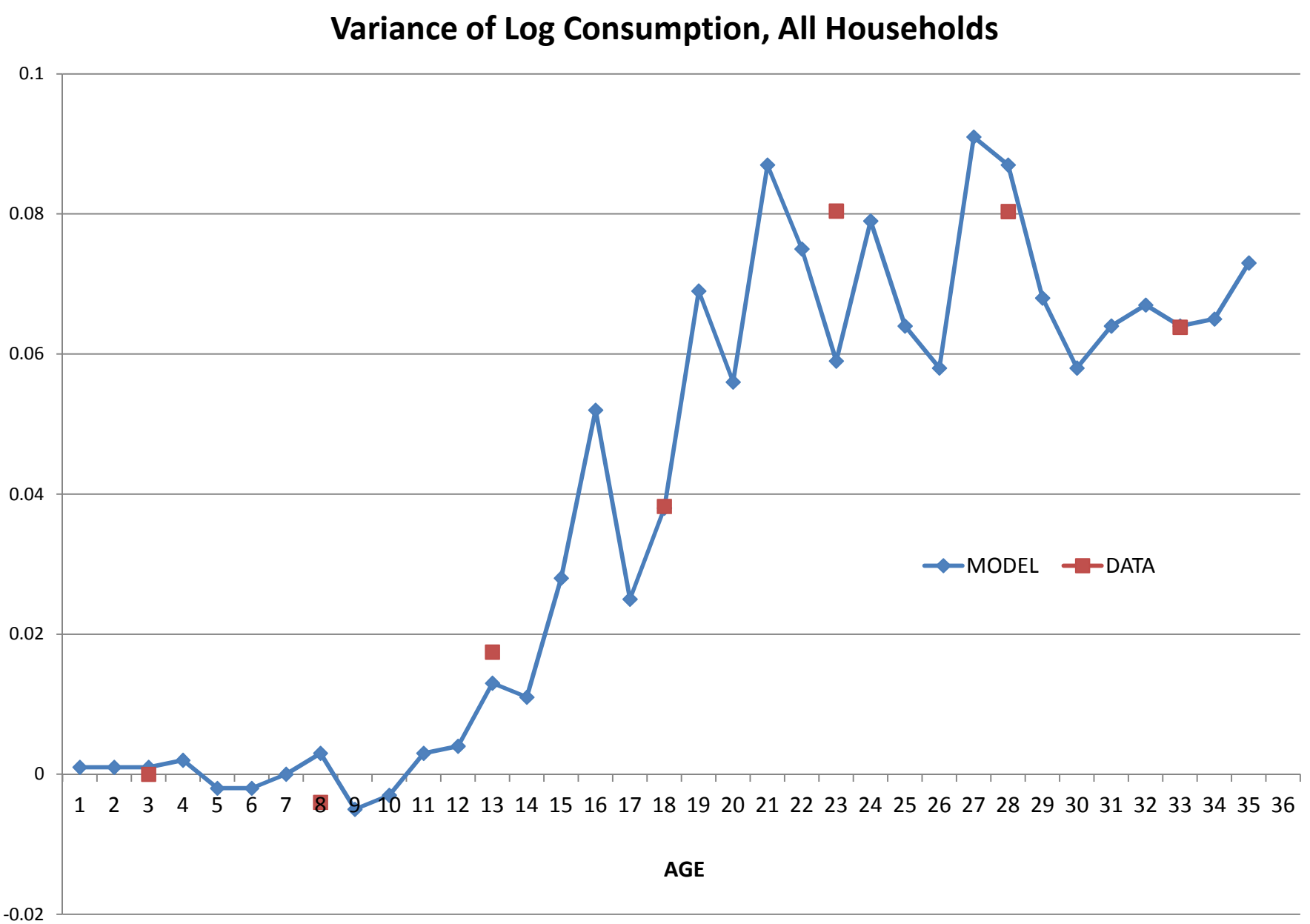

Total Transfers (as a fraction of mean household income)
Transfers ($)
8000
7000
6000
5000
4000
3000
2000
1000
0
0
0.2
0.4
0.6
0.8
1
1.2
Household Income /Mean Household Income

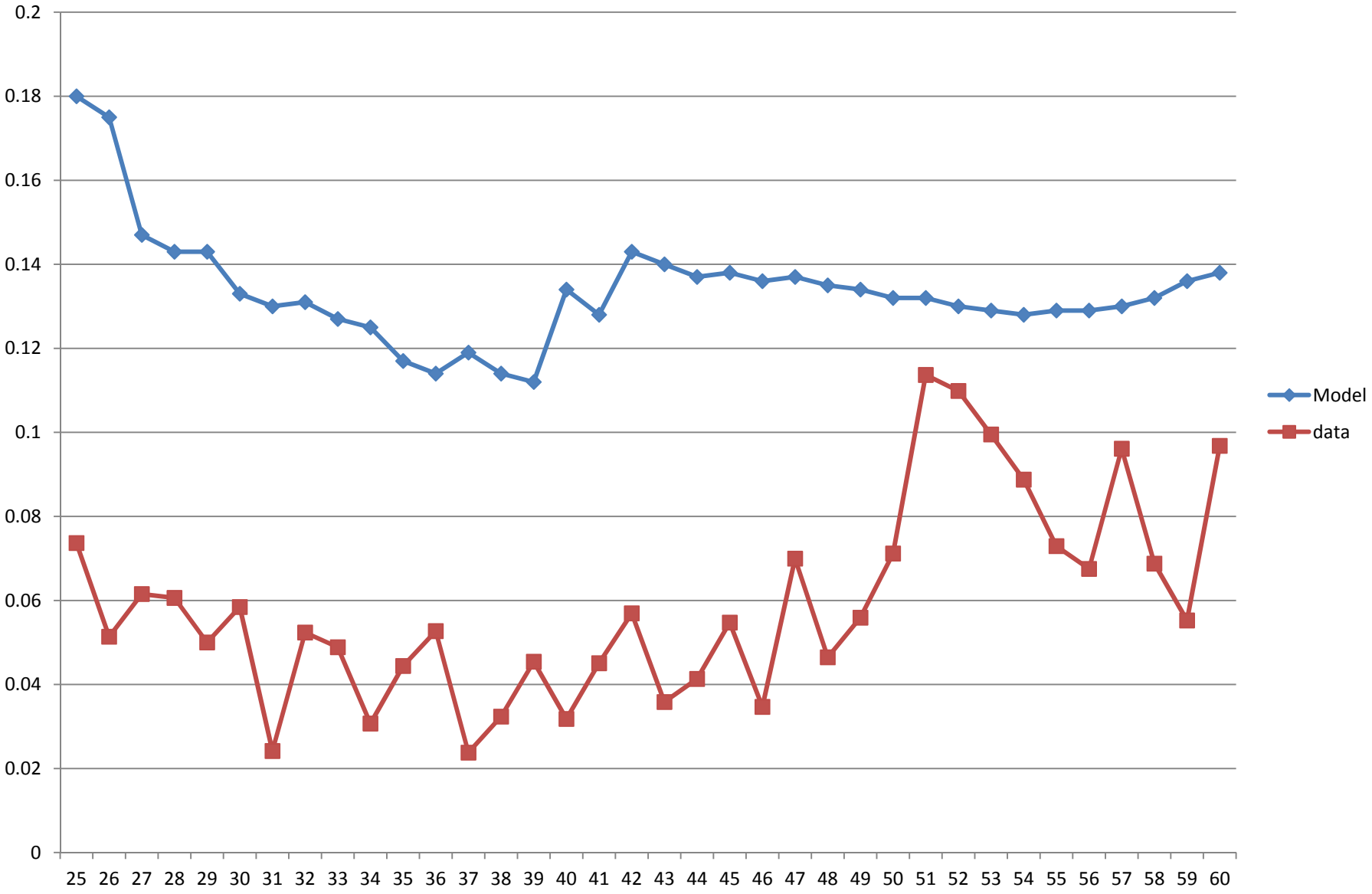

Var of Log Earnings, All Males
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
Model
Data
25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60
AGE

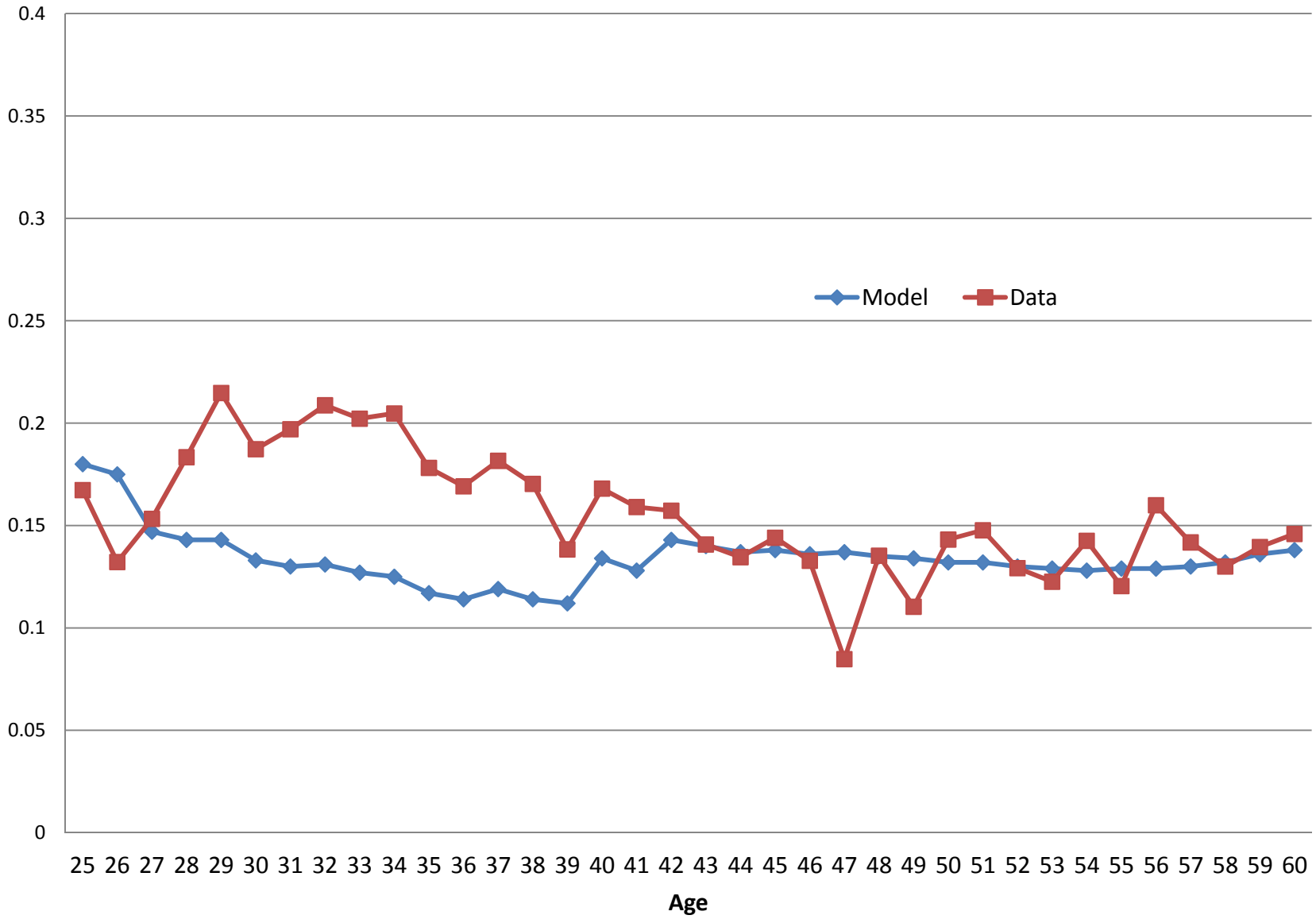

Variance of Log Earnings, Married Males
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
Model
HVY-2
25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60
AGE


Var of Log Earnings, Married Females
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
Model
Data
25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60
AGE


Var of Log Earnings, Households
0.6
0.5
0.4
0.3
0.2
0.1
0
Título del eje
25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60
AGE
ALL-model
ALL-data
MARRIED-model
MARRIED-data


Variance of Log Consumption, All Households
0.1
0.08
0.06
0.04
0.02
0
-0.02
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
AGE
MODEL
DATA


Correlation of Hours, Husbands and Wives
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60
Model
data


Correlation of Earnings, Husbands and Wives
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
Model
Data
25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60
Age

Benchmark Economy

- Captures the rise in earnings inequality for males
- Captures some of the rise in earnings inequality for all households
- More work is need for females.
- Does a very good job generating the rise in consumption inequality
- Does an OK job for correlations of earnings and hours between husbands and wives
- To do:
  - better match
  - understand the mechanism behind the relation between earnings and consumption inequality

Rethinking the Welfare State

- Replace all taxes and transfers with a proportional tax
  - Revenue neutral
  - Tax rate is 9.6%
- Replace all taxes and transfers with a Negative Income Tax (NIT)
  - Each person receives a transfer of 2.5% of mean household income in the benchmark economy (about 6800$ for a married family with two children)
  - Each household faces a proportional income tax
  - Revenue neutral
  - Tax rate is 16.3%
- Open Economy

Aggregate Effects

% Change from Benchmark Economy

	Proportional Income	Negative Income
Married Fem. LFP	5.8%	2.0
Agg. Hours	5.3%	1.3
Agg. Hours (mar. fem.)	9.3%	2.5
Hours per worker (female)	5.0%	1.3
Hours per worker (male)	3.9%	0.7
Aggregate Labor	3.8%	1.2
Aggregate Output	9.9%	0.8
Tax Rate	9.6%	16.3%

- Large effects on female labor supply and output from a proportional income tax

Welfare – Steady States

- Aggregate Welfare: -3.1%
- Winning households: 51%

Steady State Welfare Gains and Losses
Proportional Income Tax

	Single	
	Male	Fem.
hs	1.4	-19.0
sc	3.0	-11.3
col	4.8	-2.0
col+	5.8	2.9

	Married			
husband/wife	hs	sc	col	col+
hs	-11.2	-6.1	0.5	7.6
sc	-5.3	-2.2	2.4	8.1
col	0.9	3.0	5.9	9.9
col+	5.1	6.8	9.0	12.7

Welfare – Steady States

- Aggregate Welfare: -1.5%
- Winning households: 33.5%

Steady State Welfare Gains and Losses
Negative Income Tax

	Single			
	Male	Fem.		
hs	0.2	-8.7		
sc	-0.5	-6.5		
col	-0.7	-3.1		
col+	-0.5	-1.7		
	Married			
husband/wife	hs	sc	col	col+
hs	-2.5	-1.4	0.0	1.9
sc	-1.2	-0.5	0.6	2.2
col	0.3	0.8	1.6	3.0
col+	1.4	1.8	2.5	3.9

Conclusions

- Documents facts on inequality in earnings and consumption along the life-cycle for *different types of individuals and households*
- Develop a life-cycle economy that has the *potential* to account for these facts
- Use this framework to evaluate quantitatively a system that replaces current *taxes and transfers* with
    - Proportional income tax
    - Negative income tax

Quantitative Analysis – Utility Cost

- We assume that the utility cost parameter is distributed according to a (flexible) gamma distribution, $\zeta(q|z)$
- Choose the parameters to match LFP for married females, ages 25-54.

Married Female LFP, 25-54

	Females			
Males	hs	sc	col	col+
hs	60.3	75.8	83.8	89.0
sc	66.2	75.8	83.5	90.4
col	61.6	68.6	73.0	82.9
col+	53.6	60.6	62.7	76.7
Total	61.8	74.0	74.9	81.9

Social Security Benefits, Singles

	Males	Females
hs	1	0.914
sc	1.173	1.059
col	1.213	1.067
col+	1.291	1.066

Social Security Benefits, Married Coup

	Females			
Males	hs	sc	col	col+
hs	1.755	1.874	1.969	1.87
sc	1.888	1.996	1.978	2.14
col	2.012	2.057	2.096	2.20
col+	2.033	2.110	2.175	2.25