The Macro Implications of Gender and Marriage

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August 17, 2017

Facts

- Women and married people make up a large fraction of
  - Labor market participants
  - Total hours worked
  - Total earnings
- Wages, labor market participation, hours worked, and savings differ
  - By gender
  - By marital status

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- Wages, labor market participation, hours worked, and savings differ
  - By gender
  - By marital status
- Yet, most papers, unless studying female labor supply
  - Ignore women and marriage
  - Only use data on men

Questions, matching the aggregates in life cycle models

- Can we match
  - Labor participation
  - Hours worked
  - Labor income
  - Net worth
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- Can we match
  - Labor participation
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- By ignoring gender and marriage in both models and data and only considering men?
- Other calibration strategies or relatively simple models of marriage that can do better?

Questions, elasticity implications in life cycle models

- Implications for elasticities of hours and participation for
  - Different calibrations
  - Different versions of the models?

Study implications of four life-cycle models

- Economy 1: "No marriage, only men"
  - Model: single decision maker (labor supply and savings)
  - Calibration: data on men only
  - $\Rightarrow$ cannot match participation, hours, and earnings.
  - $\Rightarrow$ very low elasticities

Study implications of four life-cycle models

- Economy 1: "No marriage, only men"
  - Model: single decision maker (labor supply and savings)
  - Calibration: data on men only
- Economies 2 and 3: "No marriage, men and women together"
  - Model: single decision maker (labor supply and savings)
  - Calibration: individual-level data on men and women or household level data for couples, per capita
  - $\Rightarrow$ better match labor income but still miss participation and hours.
  - $\Rightarrow$ very high elasticities

Study implications of four life-cycle models

- Economy 4: "Married and singles"
  - Model: married and singles. Everyone chooses labor. Spouses also save and consume jointly
  - Calibration: data for married and single men and women

Study implications of four life-cycle models

- Economy 4: "Married and singles"
  - Model: married and singles. Everyone chooses labor. Spouses also save and consume jointly
  - Calibration: data for married and single men and women
  - Matches observed data well.
  - $\Rightarrow$ Modeling gender and marriage: important to understand aggregates and thus the economy at a point in time!
  - Very heterogenous elasticities by gender and marital status
  - $\Rightarrow$ Modeling gender and marriage: important to understand elasticities and thus the models' dynamics!

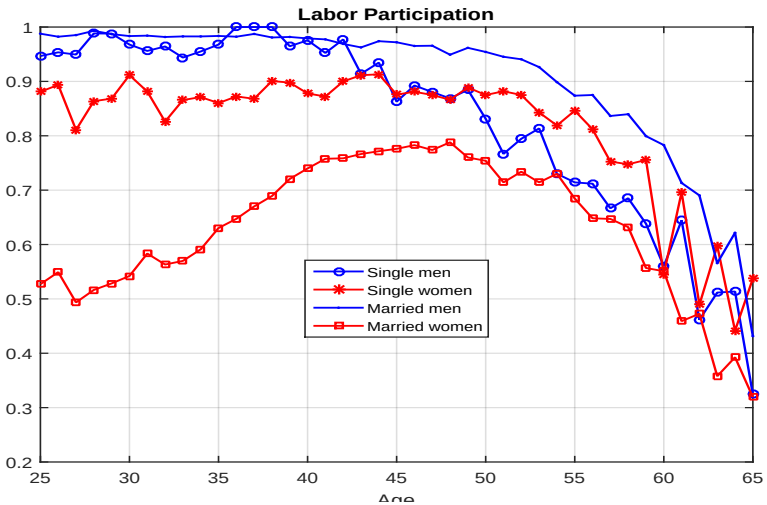
Women and married people as a fraction of workers, hours, or earnings

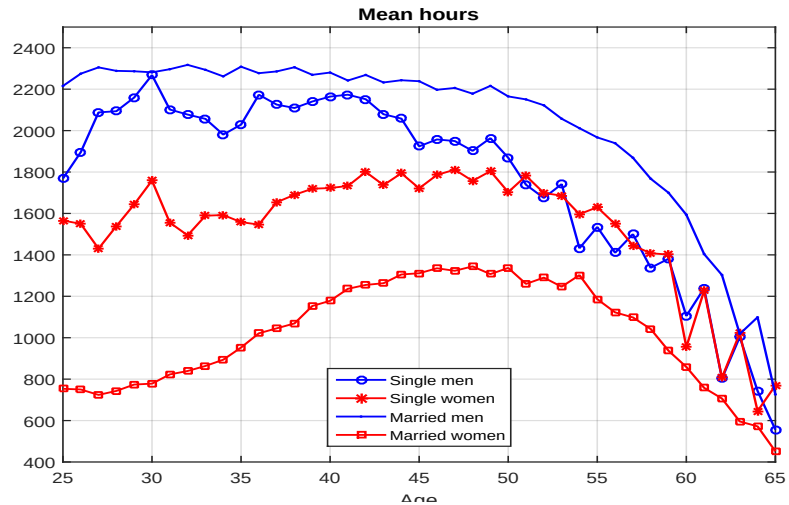
Age Group	25	35	45	55	65
Fract. women among workers	0.37	0.40	0.46	0.46	0.44
Fract. hours worked by women	0.28	0.31	0.39	0.40	0.40
Fract. earnings by women	0.24	0.22	0.30	0.27	0.27
Fract. married among workers	0.86	0.85	0.84	0.82	0.78
Fract. hours worked by married	0.86	0.86	0.84	0.83	0.80
Fract. earnings by married	0.88	0.87	0.86	0.87	0.85

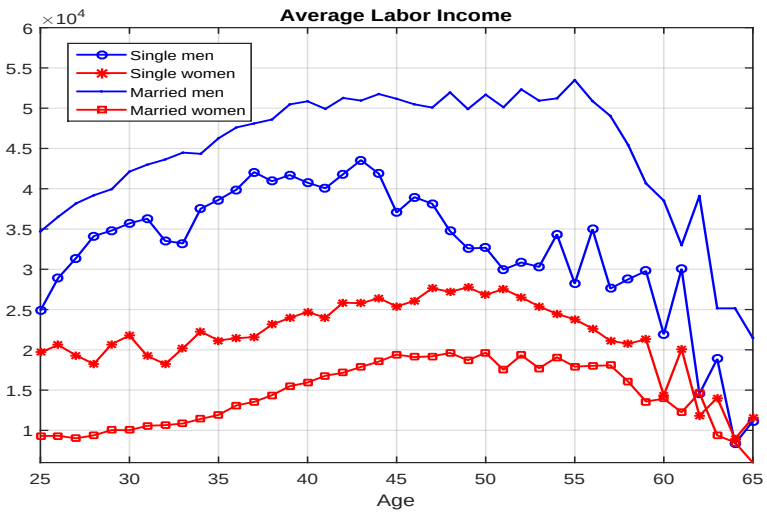
Table: 1941-1945 birth cohort

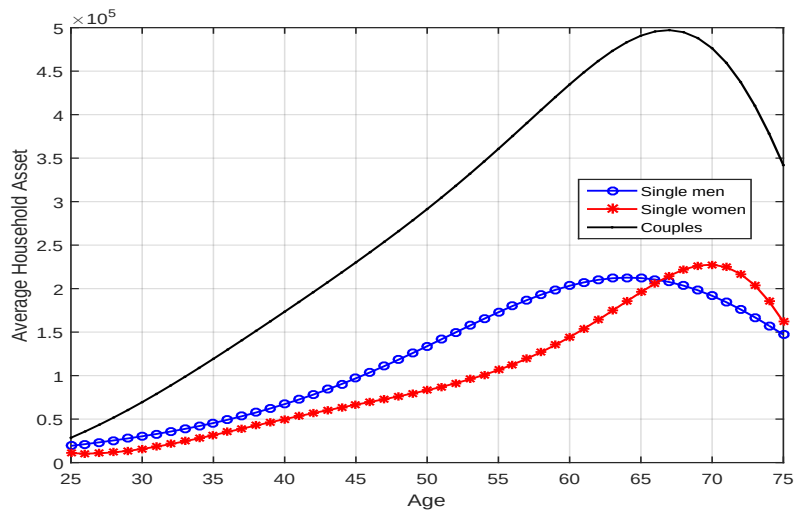
- The aggregates are comprised of large fraction of women and married people.

Single and married men and women over the life cycle









Key model features for the more general model

- Lifecycle model
- Partial equilibrium, cohort level analysis
- Period length: one year

Key model features for the more general model

- Lifecycle model
- Partial equilibrium, cohort level analysis
- Period length: one year
- Working stage (t_0 to t_r)
  - Alive for sure
  - Face shocks to their labor productivity
  - Either are married or single
  - Singles and people in couples can choose to work and hours
  - Fixed cost of working
- Retirement stage (t_r to T)
  - Exogenous probability of death. Thus, married people might lose their spouse.

Household preferences

- Discount factor: β.
- Singles:

$$v(c_t, l_t) = \frac{(c_t^{\omega} l_t^{1-\omega})^{1-\gamma} - 1}{1-\gamma}$$

- Couples:

$$w(c_t, l_t^1, l_t^2) = \frac{((\frac{c_t}{2})^{\omega}(l_t^1)^{1-\omega})^{1-\gamma} - 1}{1-\gamma} + \frac{((\frac{c_t}{2})^{\omega}(l_t^2)^{1-\omega})^{1-\gamma} - 1}{1-\gamma}$$

- Labor participation cost (time cost): $\phi_t^{i,j}$.
- j = marital status, i = gender.

Wage processes for men and women

- Deterministic age-efficiency profile: $e_t^{i,j}$.
- Shocks: AR(1) process

$$\ln \epsilon_{t+1}^i = \rho_\varepsilon^i \ln \epsilon_t^i + \upsilon_t^i, \ \upsilon_t^i \sim N(0, \sigma_\upsilon^2).$$

- Total productivity: $e_t^{i,j} \epsilon_t^i$

Recursive problem for working-age singles

$$W_t^{s,i}(a_t^i, \epsilon_t^i) = \max_{c_t, a_{t+1}, n_t} \left[v(c_t, 1 - n_t - \phi_t^{i,1} I_{n_t}) + \beta E_t W_{t+1}^{s,i}(a_{t+1}^i, \epsilon_{t+1}^i) \right]$$

$$Y_t = e_t^{i,j} \epsilon_t^i n_t \tag{1}$$

$$c_t + a_{t+1}^i = (1 + r) a_t^i + (1 - \tau_{SS}) Y_t \tag{2}$$

$$a_t \geq 0, \quad n_t \geq 0, \quad \forall t \tag{3}$$

Recursive problem for working-age couples

$$W_t^c(a_t, \epsilon_t^1, \epsilon_t^2) = \max_{c_t, a_{t+1}, n_t^1, n_t^2} \Big[w(c_t, 1 - n_t^1 - \phi_t^{1,2} I_{n_t^1}, 1 - n_t^2 - \phi_t^{2,2} I_{n_t^2}) + \beta E_t W_{t+1}^c(a_{t+1}, \epsilon_{t+1}^1, \epsilon_{t+1}^2) \Big] \tag{4}$$

$$Y_t^i = e_t^{i,j} \epsilon_t^i n_t^i \quad i = 1, 2 \tag{5}$$

$$c_t + a_{t+1} = (1 + r) a_t + (1 - \tau_{SS})(Y_t^1 + Y_t^2) \tag{6}$$

$$a_t \geq 0, \quad n_t^1, n_t^2 \geq 0, \quad \forall t \tag{7}$$

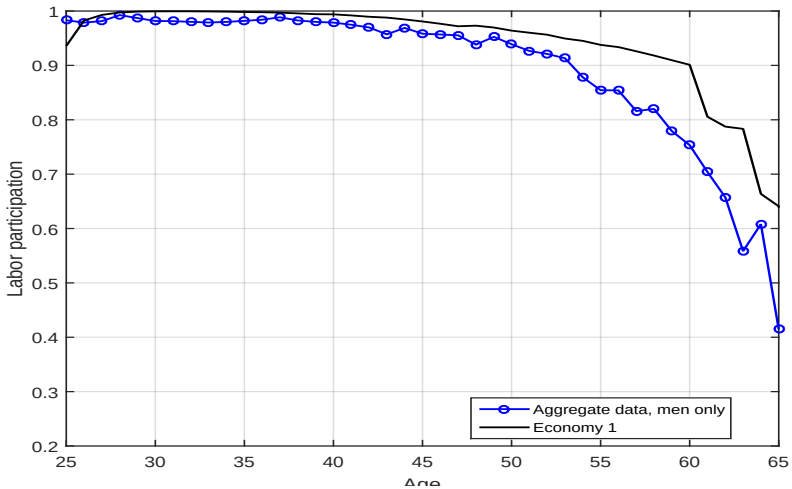
Economy 1: The singles economy, calibrated parameters

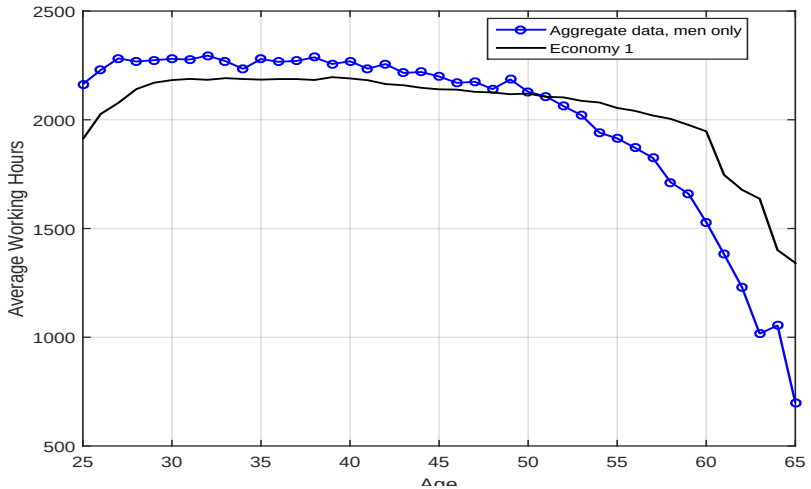
- Model: single decision maker
- Calibration: data on men only

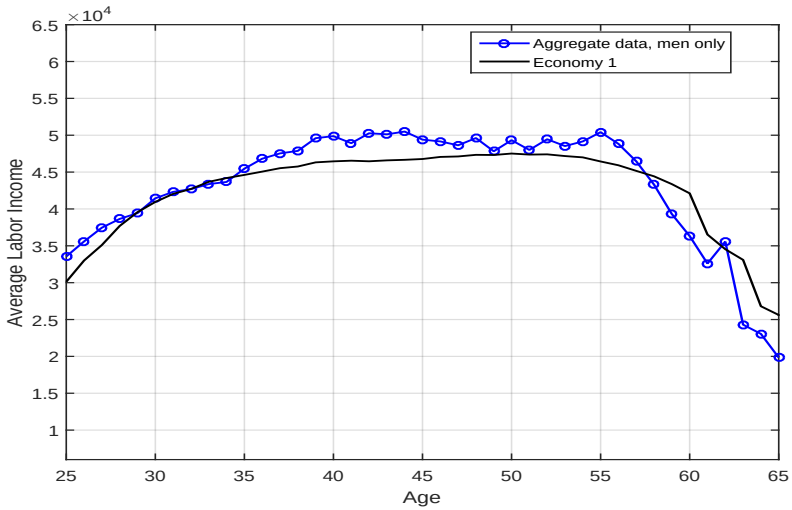
Parameters		Value
β	Discount factor	0.957
ω	Consumption weight	0.510
$\phi_t^{i=1,j}$	Labor participation cost	0.283
$Y_r^{i=1,s}$	Social Security benefit	\$8023
Moments	**Data**	**Model**
SS budget deficit	0.000	0.002
Average assets, men at 50	148710	149017
Average hours, men at 50	2129	2120
Participation, men at 50	0.939	0.964

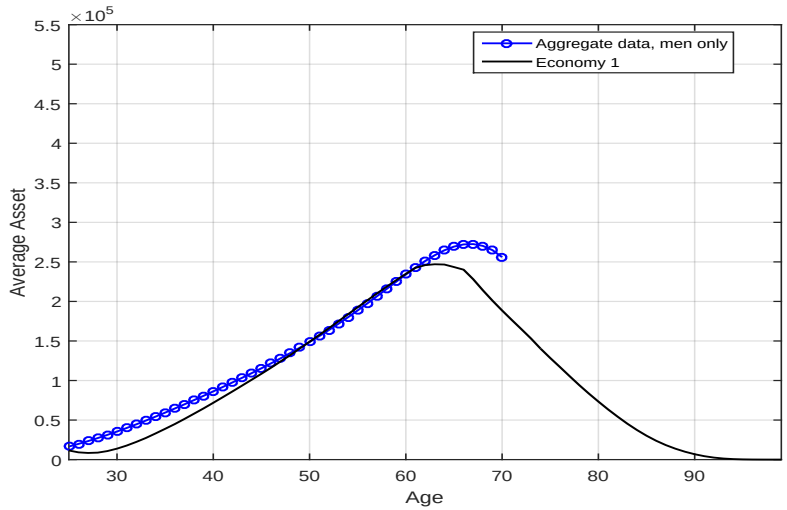
Table: Parameters in the singles economy

The singles economy, profiles fit

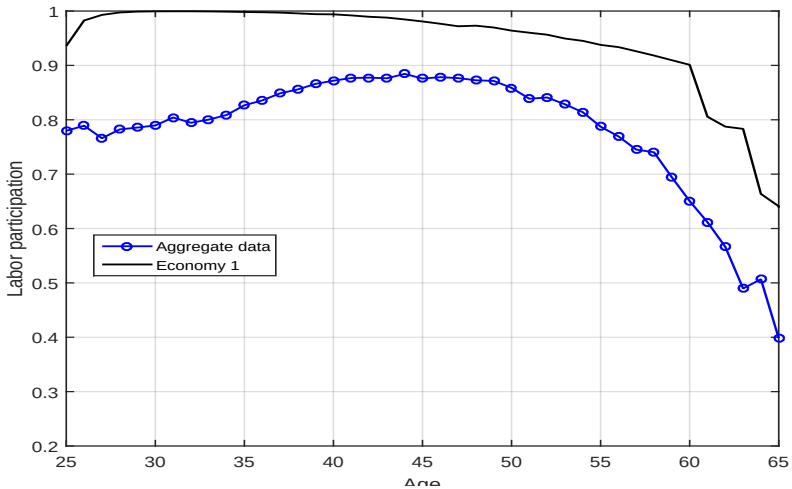


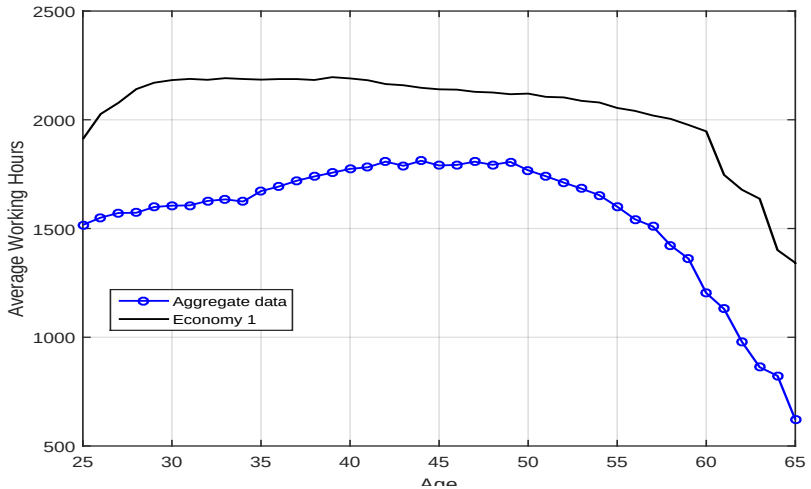


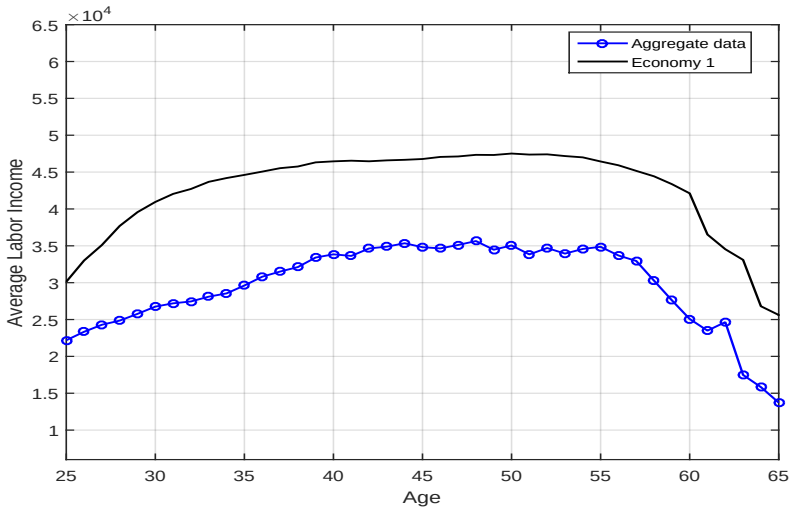


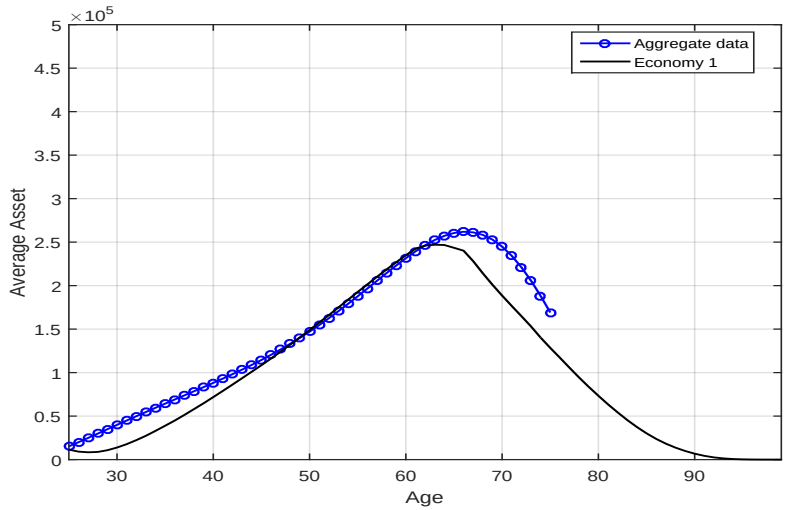


Aggregating up the profiles by gender and marital status









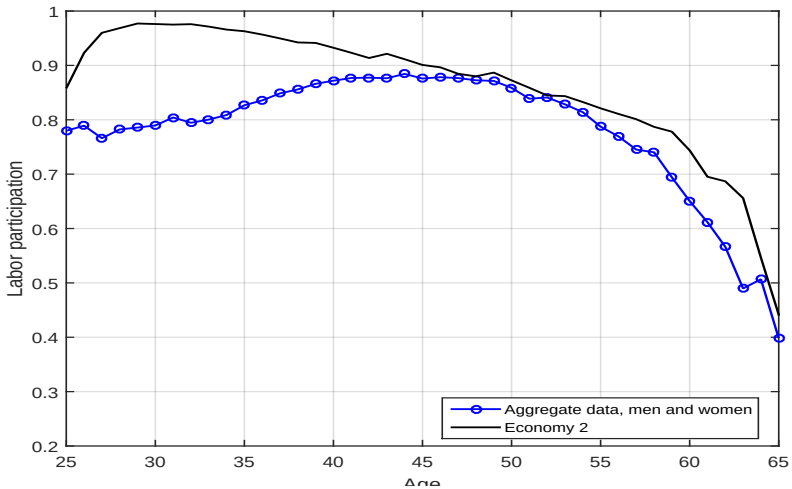
Economy 2, a no marriage economy calibrated to men and women together, calibrated parameters

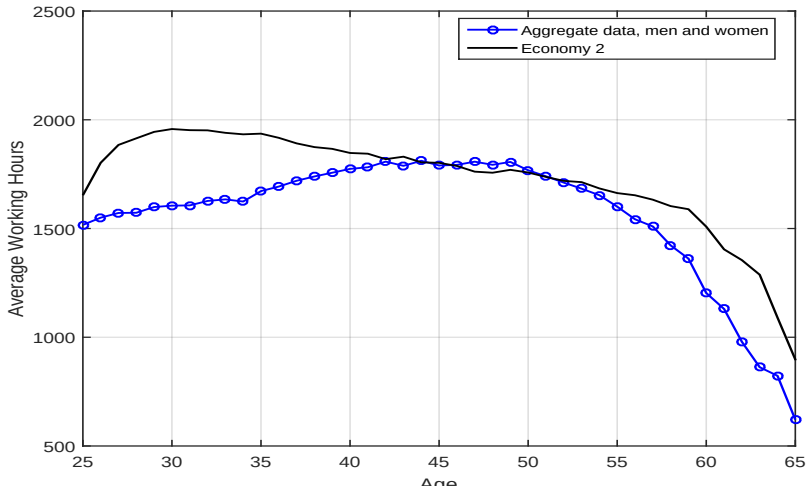
- Model: single decision maker
- Change: efficiency profile, AR(1) process, and survival rates

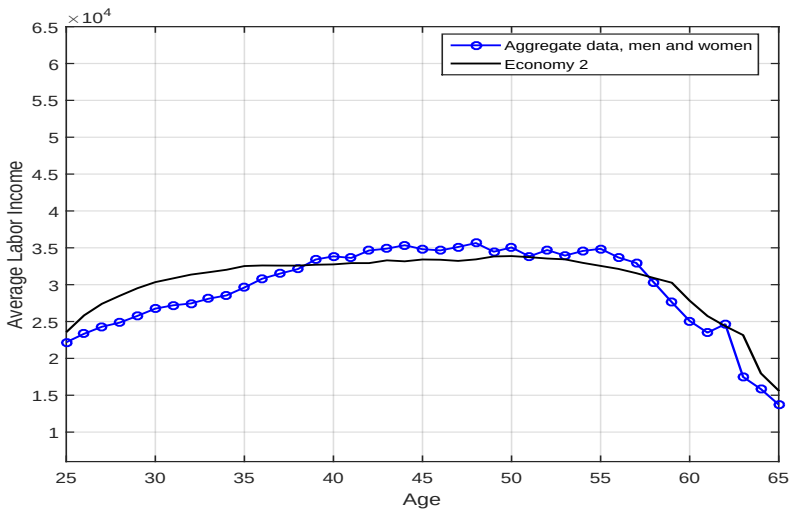
Parameters		Value
β	Discount factor	0.958
ω	Consumption weight	0.471
$\phi_t^{i=1,j}$	Labor participation cost	0.302
$Y_r^{i=1,s}$	Social Security benefit	\$5006
SS budget deficit	0.000	−0.001
Average assets, individuals at 50	147134	147530
Average hours, individuals at 50	1768	1758
Participation, individuals at 50	0.859	0.872

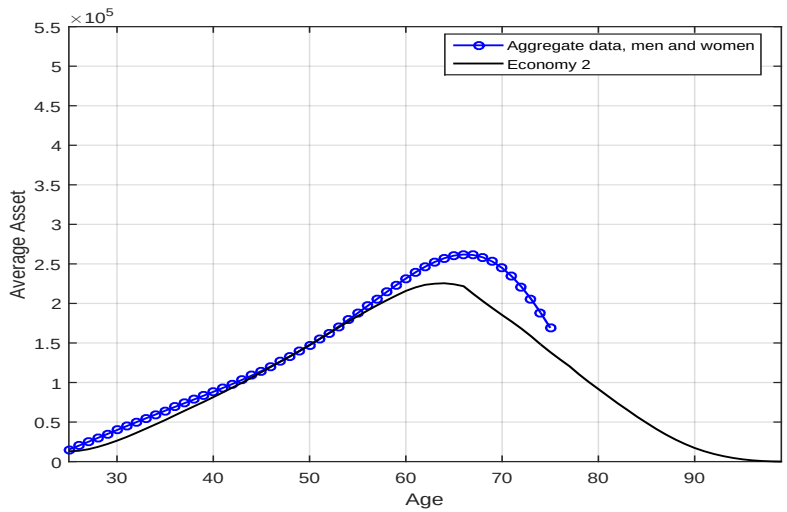
Table: Parameters used in the singles economy

Economy 2, profiles fit, thus the aggregates









Economy 4: The marriage economy, parameters

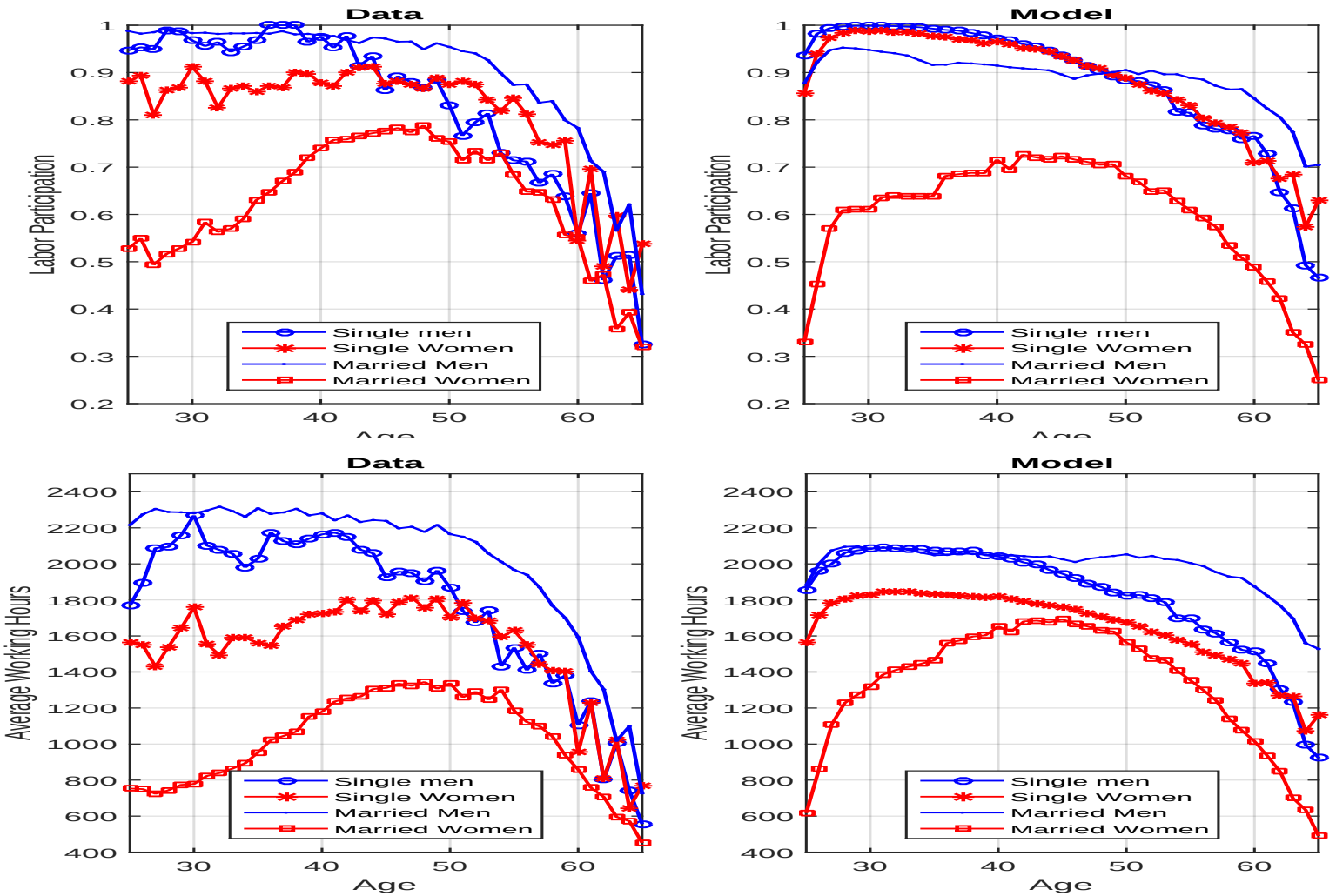
Parameters (9)		Value
β	Discount factor	0.959
ω	Consumption weight	0.499
$\phi_t^{i=1,j}$	Men participation cost	0.318
$\phi_t^{i=2,j=1}$	Single women part. cost	0.385
$\phi_t^{i=2,j=2}$	Married women part. cost	See next
$Y_r^{i=1,s}$	Single men SS benefit	$\$6,764$

Table: Parameters used in the marriage economy.

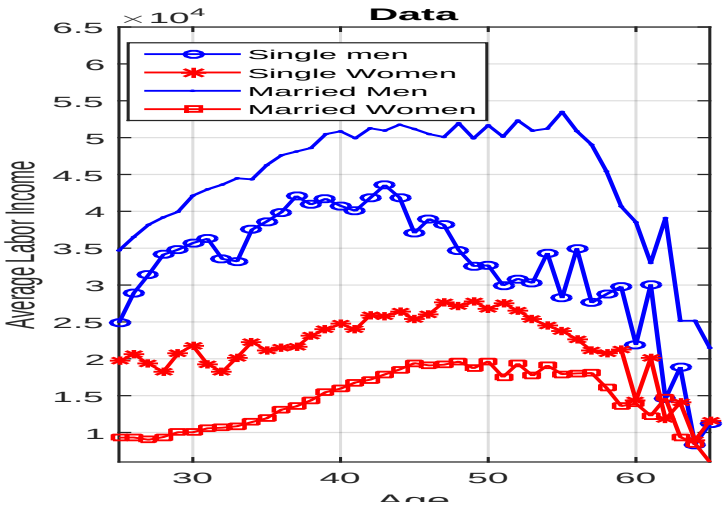
The marriage economy, model fit

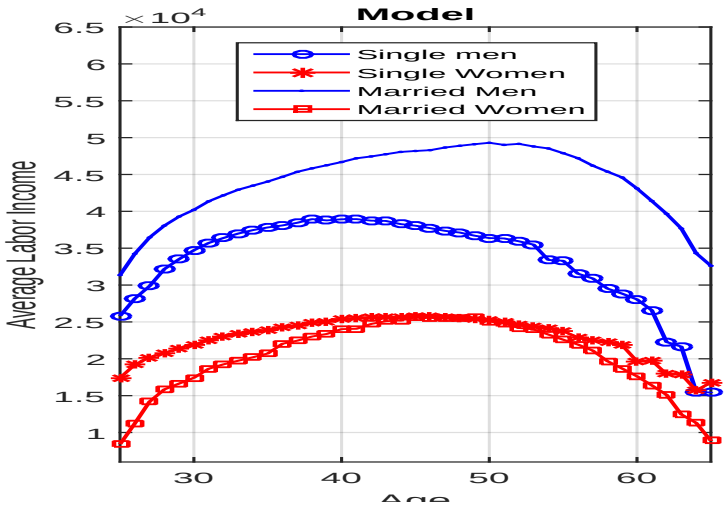
Moments (14)	Data	Model
SS budget deficit	0.000	0.009
Avg. assets, single men at 50	133821	157842
Avg. assets, single women at 50	83156	85419
Avg. assets, couples at 50	291433	214084
Avg. hours, single men at 50	1869	1825
Avg. hours, single women at 50	1703	1675
Avg. hours, married men at 50	2165	2053
Avg. hours, married women at 50	1337	1563
Part., single men at 50	0.831	0.883
Part., single women at 50	0.875	0.889
Part., married women at 30	0.542	0.611
Part., married women at 40	0.740	0.716
Part., married women at 50	0.754	0.681
Part., married women at 60	0.551	0.488

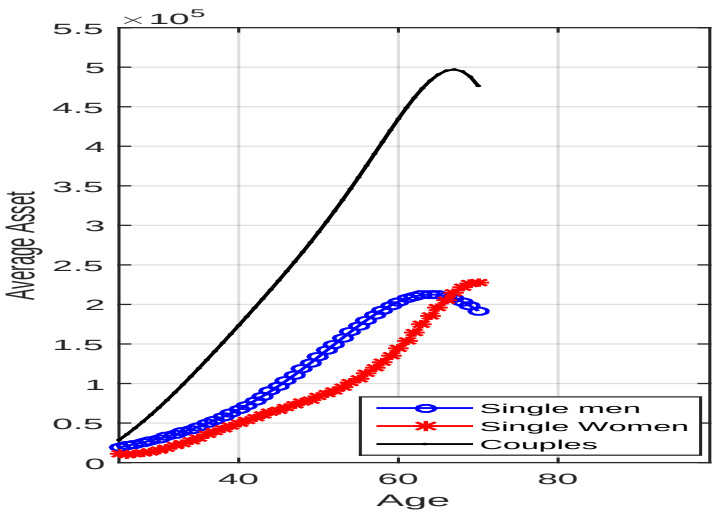
The marriage economy, profiles fit

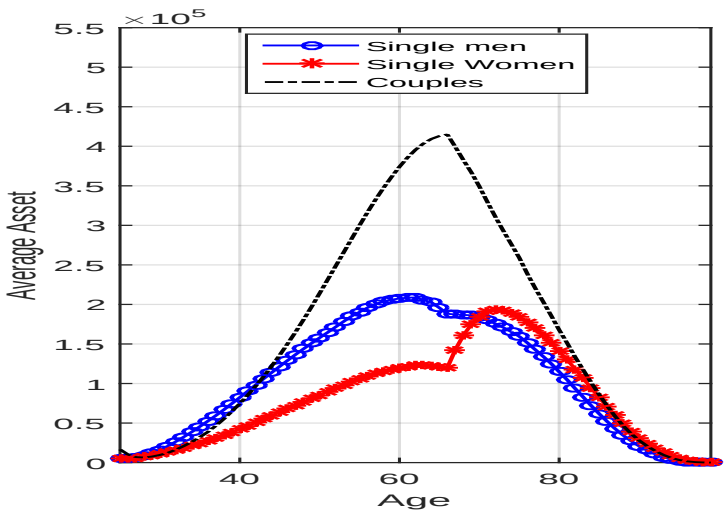


The marriage economy, profiles fit

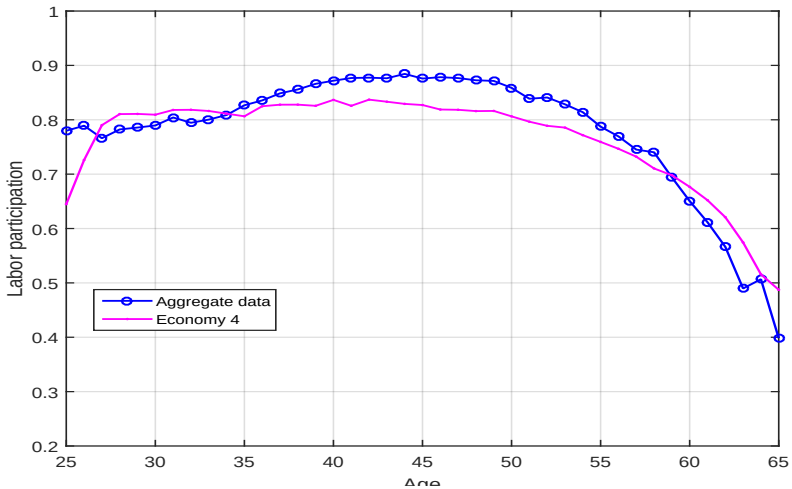


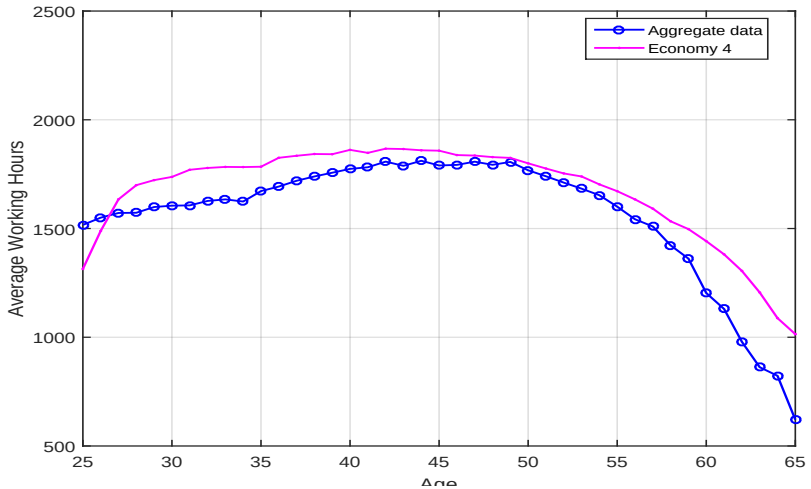


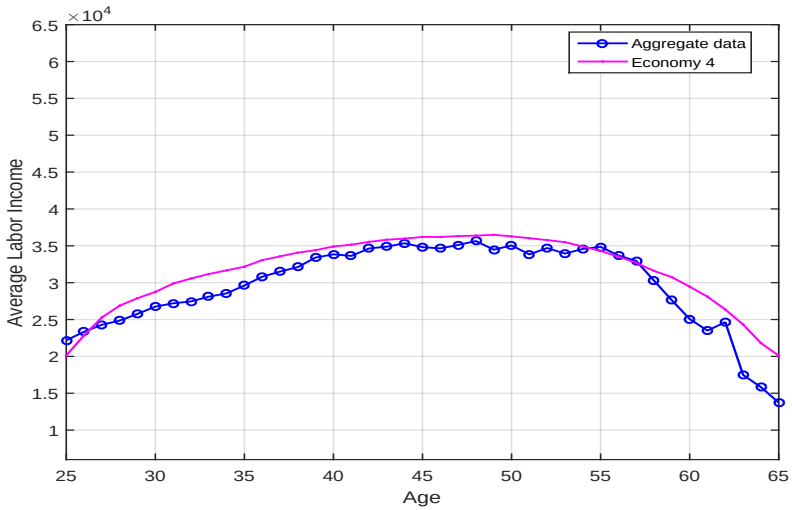


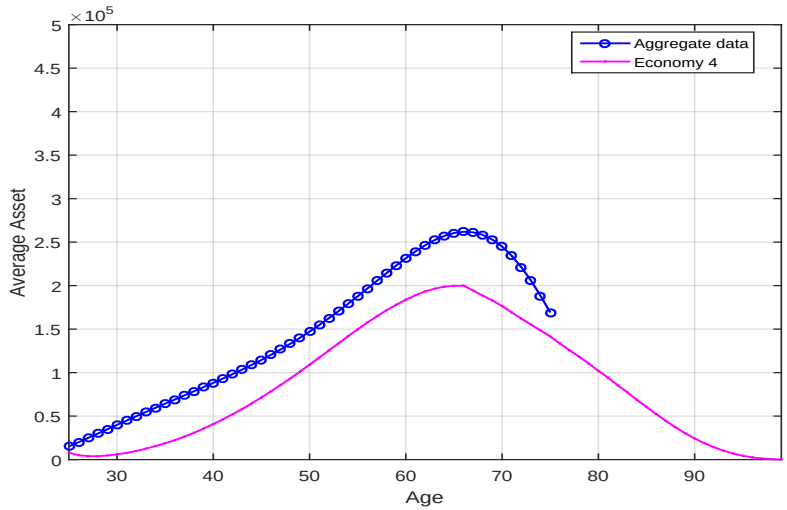


Aggregating up the profiles by gender and marital status









Aggregating up the profiles, what have we learned?

- The economy with only men, calibrated using men
  - Overestimates participation by 10 percentage points
  - Overestimates average hours by about 500 hours
  - Overestimates average earnings by age
- Adding women in the calibration helps in fitting the aggregates.
- The marriage economy does a much better job of fitting aggregate behavior by age

Compensated elasticities by age (singles economies)

	Participation in economy			Hours in economy		
Age	1	2	3	1	2	3
30	0.01	0.37	0.25	0.49	1.13	0.94
40	0.06	0.89	0.58	0.47	1.59	1.29
50	0.24	1.29	0.53	0.73	1.75	1.16
60	0.36	1.32	2.68	0.74	1.87	3.11

- Elasticity increases by age.
- Economy 1 has the lowest elasticity.

Compensated elasticity by age (marriage economy)

	Participation					Hours				
	Single		Married			Single		Married		
	M	W	M	W	All	M	W	M	W	All
30	0.02	0.23	0.07	1.02	0.39	0.09	0.52	0.30	-0.01	0.20
40	0.34	0.54	0.22	1.85	0.86	0.33	0.46	0.44	0.41	0.44
50	0.99	1.50	0.49	1.76	1.06	0.42	0.46	0.46	0.38	0.43
60	0.83	3.42	0.91	1.59	1.30	0.84	0.15	0.51	0.55	0.50

- Large heterogeneity
- Larger elasticity for women

Conclusions

- Substantial differences by gender and marital status in
  - Labor market outcomes
  - Savings
- Women and marriage matter for
  - The aggregates
  - Labor supply elasticities
- Modeling marriage and gender is important!