Inequality and the Marriage Gap

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Table 1. Summary statistics

	Mean ($)	Median ($)	Gini	Bott 40%	Top 5%
All households					
Labor earnings	60,570	33,480	0.64	3.2	33.5
Total income	84,019	48,393	0.55	10.5	33.1
Wealth	469,343	86,700	0.81	0.1	57.2
Married households					
Single households					

NOTES: Based on the 2013 wave of the Survey of Consumer Finances (SCF).

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Wealth	469,343	86,700	0.81	0.1	57.2
Married households					
Labor earnings	84,746	55,799	0.57	7.2	29.7
Total income	113,724	71,017	0.51	12.4	31.2
Wealth	652,870	154,520	0.79	1.0	53.7
Single households					
Labor earnings	27,380	13,189	0.68	0.2	34.7
Total income	43,237	29,421	0.49	13.0	29.1
Wealth	217,384	35,801	0.81	−1.6	56.7

NOTES: Based on the 2013 wave of the Survey of Consumer Finances (SCF).

The Marriage Gap

- Earnings, income and wealth highly concentrated
- When partitioned into single and married households:
  - Within-group inequality remains very large
  - Striking disparity between the groups: Married people earn significantly more income and they hold more assets than singles
- To make this point explicit, define marriage gap as:

$$\Delta(x) \equiv 100 \cdot \left(\frac{1}{2} x^{\mathcal{M}} / x^{\mathcal{S}} - 1 \right)$$

$x^{\mathcal{M}}$ denotes the value for married households (e.g. average wealth)
$x^{\mathcal{S}}$ denotes the value for single households

Table 2. The Marriage Gap

Dependent variable	(1)	(2)	(3)	(4)
Labor earnings				
Mean	32.3***			
	(3.1)			
Median	23.6***			
	(1.9)			
Total income				
Mean	25.5***			
	(3.4)			
Median	17.4***			
	(1.6)			
Wealth				
Mean	34.9***			
	(4.8)			
Median	76.9***			
	(5.4)			
Age	no	yes	yes	yes
Race	no	no	yes	yes
Child below 6	no	no	no	yes

NOTES: SCF: 2001-2013, five waves. Constant and time dummies included in all specifications.

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Dependent variable	(1)	(2)	(3)	(4)
Labor earnings				
Mean	32.3***	28.9***	23.2***	23.0***
	(3.1)	(3.0)	(3.0)	(3.0)
Median	23.6***	20.6***	15.6***	16.9***
	(1.9)	(2.1)	(1.8)	(1.9)
Total income				
Mean	25.5***	18.9***	13.6***	12.6***
	(3.4)	(3.3)	(3.3)	(3.3)
Median	17.4***	7.9***	4.5***	4.8***
	(1.6)	(1.2)	(1.1)	(1.2)
Wealth				
Mean	34.9***	42.4***	29.9***	29.6***
	(4.8)	(5.0)	(4.7)	(4.8)
Median	76.9***	33.9***	27.5***	29.2***
	(5.4)	(2.3)	(2.1)	(1.9)
Age	no	yes	yes	yes
Race	no	no	yes	yes
Child below 6	no	no	no	yes

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This paper

- Economic prosperity strongly associated with marital status
- What are the causes behind the marriage gap? $\rightarrow$ Need a model.

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- Economic prosperity strongly associated with marital status
- What are the causes behind the marriage gap? $\rightarrow$ Need a model.
- Standard models of inequality: All households are comprised of single decision-maker, no role for the family
- This paper: Develops a quantitative macroeconomic model that accounts explicitly for different household structures:
  - Single females
  - Single males
  - Married couples

- Life cycle with working age and retirement, different education levels, uninsurable risks induce inequality in earnings and wealth, marriage decisions are endogenous, fertility is exogenous and depends on marital status
- Calibrated model largely successful in accounting for empirical facts
- Three factors are key for generating the marriage gap:

- Life cycle with working age and retirement, different education levels, uninsurable risks induce inequality in earnings and wealth, marriage decisions are endogenous, fertility is exogenous and depends on marital status
- Calibrated model largely successful in accounting for empirical facts
- Three factors are key for generating the marriage gap:
  1. Strong selection effects: More productive and asset-rich individuals are also more likely to find a spouse on the marriage market
  2. Stronger dynastic ties in households with descendants $\rightarrow$ Bequests
  3. Differential tax treatment favors married couples (joint tax filing)
- Simulate policy reform of abolishing joint filing $\rightarrow$ Output gains

Literature

1. Income and wealth inequality, e.g.
   - Aiyagari (1994), Huggett (1996), Krusell/Smith (1998)
   - Castañeda/Díaz-Giménez/Ríos-Rull (2016), de Nardi (2004)
2. Single vs married, e.g.
   - Aiyagari/Greenwood/Guner (2000), Greenwood/Guner/Knowles (2003)
   - Regalia and Ríos-Rull (2001), Hong/Ríos-Rull (2007)
   - Heathcote/Storesletten/Violante (2009), Guvenen/Rendall (2015)
3. Inequality and marital status, e.g.
   - Guner/Knowles (2004), Mustre-del-Río (2015)
   - Greenwood/Guner/Kocharkov/Santos (2016)
4. Dynamic models with equilibrium marriage markets, e.g.
   - Cubeddu/Ríos-Rull (2003), Fernández/Wong (2014)
   - Mazzocco/Ruiz/Yamaguchi (2007), Voena (2015), Santos/Weiss (2016)

Model

Demographics

- Overlapping-generations production economy
- Each period a cohort of new individuals enters economy
- Half of them are born as females, half as males
- Stochastic life cycle: Working age $\xrightarrow{\phi^R}$ Retirement $\xrightarrow{\phi^D}$ Death
- An individual can live in a one-person (single) or two-person household
- Marriages are formed endogenously, divorces occur exogenously at rate ψ
- Only working-age indiv. marry and divorce, married HH retire and die jointly

Preferences and Labor productivity

- Utility function $U^g(c, h)$, $g = f, m$
- Bequest motive $\rightarrow$ Strength depends on presence of descendants
- Fixed utility of marriage χ captures cultural and other non-economic gains

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- Labor productivity during working age: $e_t^i = \exp(\xi^i + z_t^i)$
  - ξ^i: Permanent component determined when agent is born (ability)
  - z_t^i : Time-varying component evolves according to

$$z_t^i = \rho^\xi z_{t-1}^i + \epsilon_t^i \qquad \text{with } \epsilon_t^i \overset{\text{i.i.d.}}{\sim} N(0, \sigma_\epsilon^\xi)$$

  - Retired agents not productive ($e = 0$)

Marriage market

- Every single person participates each period with prob. p (bench: $p = 1$)
- Randomly meets single person of opposite gender $\rightarrow$ They observe each other's characteristics (labor productivity and wealth) $\rightarrow$ Marry yes/no?
- Marriage decision bilateral: Both have to be better off

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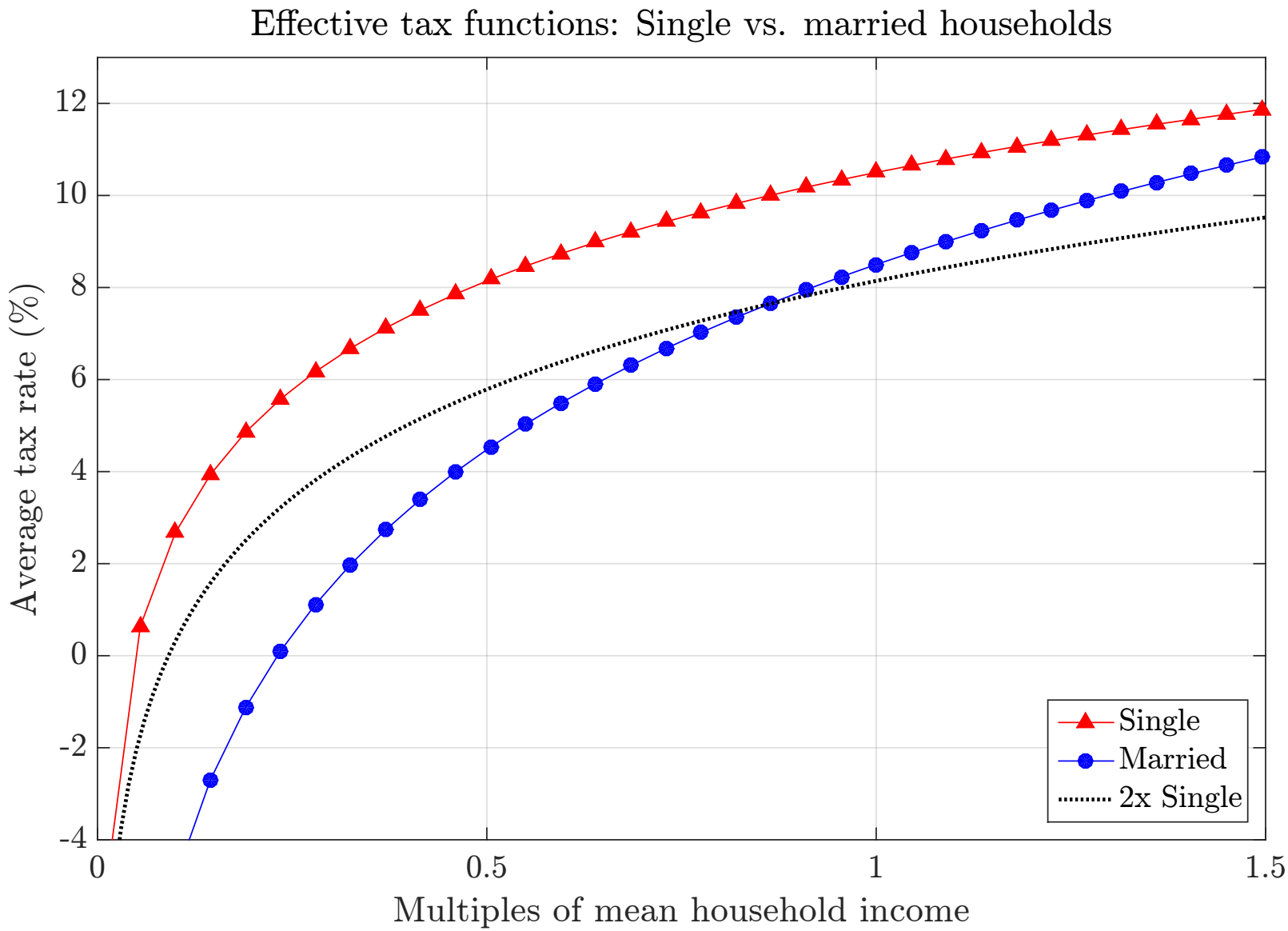
- Marriage decision bilateral: Both have to be better off
- Potential couple: Cooperative bargaining process, Pareto weights, unitary model, full commitment, exogenous divorce
- Meetings not resulting in new marriage: Both remain single until next period
- Random matching: Probability of meeting potential spouse with specific characteristics depends on actual availability, i.e. the equilibrium distribution!

Intergenerational links

- Successive generations partially linked through descendants
- Have an impact on bequest motive and transmission of wealth
- Presence of descendants captured by binary variable $d \in \{0, 1\}$
- Prob. depends on household structure: Each period during working age, married couples are assigned descendants with prob. $\pi^{\mathcal{M}}$
- Single persons: Probability $\pi^{\mathcal{S},\xi}$
- Directed bequests if $d = 1$, accidental bequests if $d = 0$
- Calibration: Stronger bequest motive for people with descendants

Asset markets, Firms, Government

- Self-insurance through accumulation of riskless asset (capital)
- General equilibrium: Production function $F(K, L) = K^{\alpha} L^{1-\alpha}$
- Gender gap in wage rates
- Government: Taxes income and pays out retirement benefits
- Nonlinear tax on households' income: $\tau^{\mathcal{S}}(y)$ and $\tau^{\mathcal{M}}(y)$
- Joint filing for married couples


Effective tax functions: Single vs. married households
Average tax rate (%)
12
10
8
6
4
2
0
-2
-4
0
0.5
1
1.5
Multiples of mean household income
Single
Married
2x Single

Data and Calibration

- Current Population Survey (CPS) and Survey of Consumer Finances (SCF)
- Calibrate the model so that it matches e.g.
  - Demographic composition (age, education, marital status, descendants)
  - Hours worked by females and males and Frisch elasticities
  - Gender wage gap, college premium
  - Wealth differential 73+ years between $d = 0, 1$ ($\rightarrow$ bequest motive)
  - Wage processes, capital-output ratio, capital share etc.

▸ Parameters set externally

▸ Parameters set internally

Results

Table 4. Main results

A. Model Statistics		Gini	Bottom 40%	Top 5%
Labor earnings	All households	0.43	13.1	17.9
	Married	0.32	20.1	14.9
	Single	0.46	11.8	23.9
Total income	All households	0.46	12.5	20.4
	Married	0.37	17.9	17.2
	Single	0.48	12.5	22.2
Wealth	All households	0.66	2.4	30.4
	Married	0.59	5.3	25.2
	Single	0.69	2.2	32.1
B. Marriage gap		Δ^{Mean}	Δ^{Median}	

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B. Marriage gap		Δ^{Mean}	Δ^{Median}	
Labor earnings	Data	+ 32.3	+ 23.6	
	Model	+ 5.6	+ 21.0	
Total income	Data	+ 25.5	+ 17.4	
	Model	+ 7.2	+ 23.3	
Wealth	Data	+ 34.9	+ 76.9	
	Model	+ 26.0	+ 99.8	

The Marriage Gap: Decomposition

	Labor earnings		Total income		Wealth	
	Δ^{Mean}	Δ^{Median}	Δ^{Mean}	Δ^{Median}	Δ^{Mean}	Δ^{Median}
Data	+ 32.3	+ 23.6	+ 25.5	+ 17.4	+ 34.9	+ 76.9
Benchmark model	+ 5.6	+ 21.0	+ 7.2	+ 23.3	+ 26.0	+ 99.8

Counterfactual experiments:

M1: Stronger dynastic links in HH with descendants → Impose identical bequest motive

M2: Differential tax treatment → Shift tax schedule for couples upwards

M3: Selection into marriage → Set $p = 0.25$ (marriage choices mostly based on luck)

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M1: Intergenerational ties	+ 3.3	+ 18.2	+ 4.9	+ 21.6	+ 20.5	+ 83.9

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M1: Intergenerational ties	+ 3.3	+ 18.2	+ 4.9	+ 21.6	+ 20.5	+ 83.9
M2: M1 + Tax treatment	+ 1.2	+ 15.6	+ 2.7	+ 19.7	+ 15.2	+ 73.5

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M2: M1 + Tax treatment	+ 1.2	+ 15.6	+ 2.7	+ 19.7	+ 15.2	+ 73.5
M3: M1 + M2 + Selection	− 2.8	+ 9.2	− 2.7	+ 12.1	− 4.7	+ 44.7

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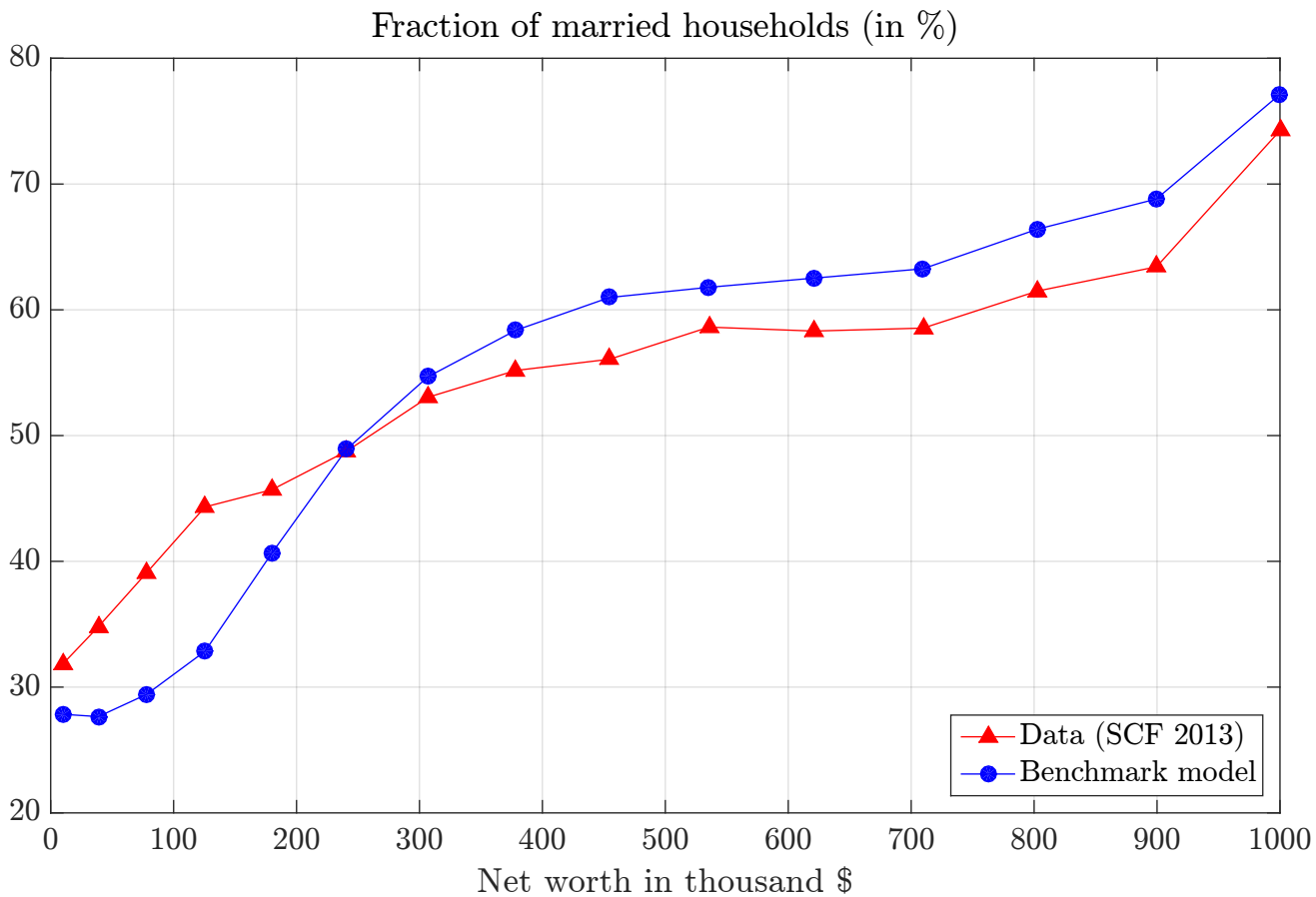
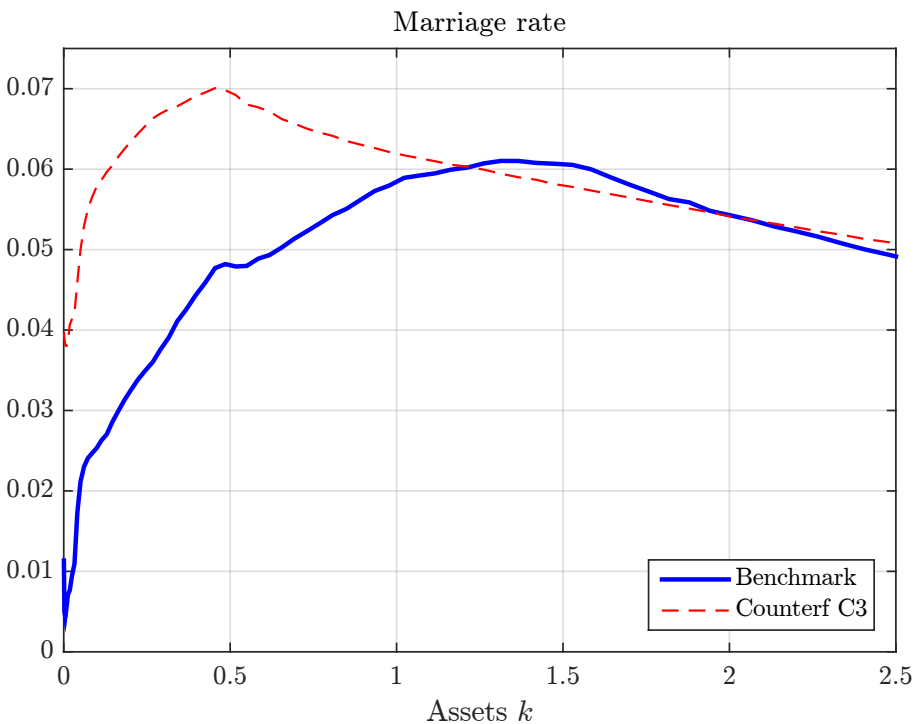
Fraction of Married HH along the Wealth Distribution

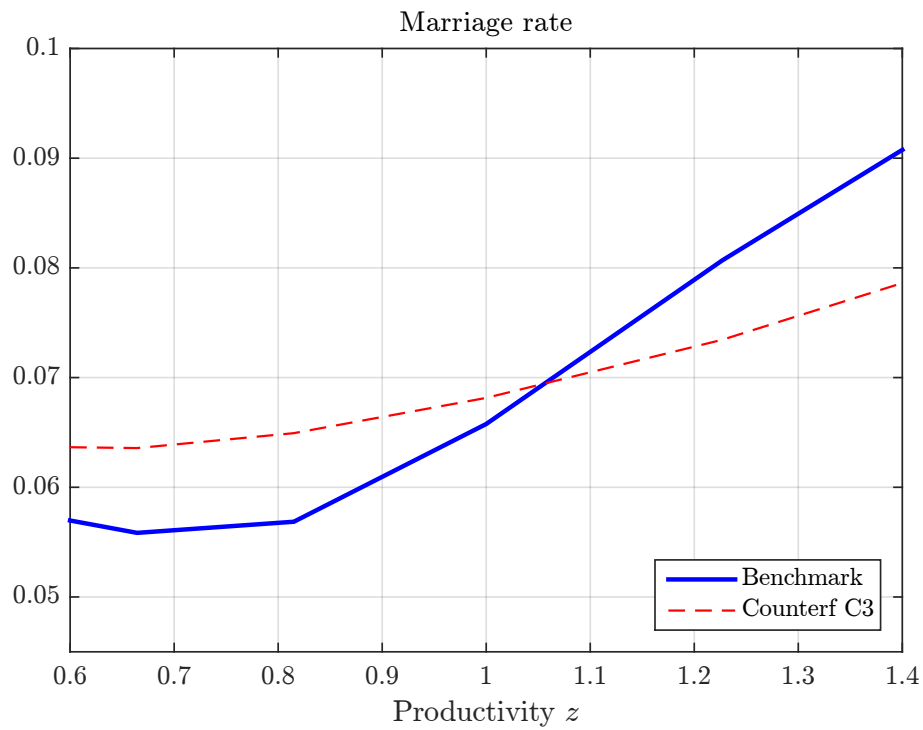


- Steep gradient from 0 to 300k dollars, then remains almost flat
- Suggests that marriage plays relatively larger role for poor and middle-class HH

Marriage Rates

- High-productive, wealthy singles are more likely to meet someone who is willing to marry them... but they are also more picky! $\rightarrow$ Which effect dominates?





Policy Experiment: Separate Tax Filing

- Simulate hypothetical policy reform: All agents, single or married, are subject to the same effective tax schedule $\tau^{\mathcal{S}}$
- Government budget is balanced through lump-sum tax/transfer

Table 6. Long-run effects of policy reforms

Description	Joint	Separate	Description	Joint	Separate

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- Simulate hypothetical policy reform: All agents, single or married, are subject to the same effective tax schedule $\tau^{\mathcal{S}}$
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Table 6. Long-run effects of policy reforms

Description	Joint	Separate	Description	Joint	Separate
Total output	0.602	0.618	Gini coef wealth	0.667	0.690
Aggregate capital	1.816	1.881	Δ^{Mean} Earnings	+5.6	+38.8
Aggregate labor	0.323	0.331	Δ^{Mean} Income	+7.2	+37.8
Real interest rate (%)	1.970	1.850	Δ^{Mean} Wealth	+26.0	+84.2
Average wage rate	0.558	0.561	Welfare females *nc*	–	−0.44%
Hours worked females	0.256	0.266	Welfare females *co*	–	+0.90%
Hours worked males	0.345	0.349	Welfare males *nc*	–	−2.26%
% couples same educ	0.594	0.869	Welfare males *co*	–	+0.24%

Concluding Remarks

- Paper takes a step towards refined understanding of interaction between marriage and economic inequality
- Main contribution: Develops a model that is quantitatively consistent with the salient facts from the data
- Relates directly to well-known long-run trends in most developed countries:
  - Increasing inequality: Income, wealth, ...
  - Changes in living arrangements: Family size, children, ...
- Redistributive policies need to acknowledge differential demand for insurance by singles and couples, households with and without children, etc.

Table C1. Parameters set externally

Description	Param	Value	Description	Param	Value
Prob. of retiring	ϕ^R	1/40	Meeting probability	p	1
Prob. of dying	ϕ^D	1/20	Capital share	α	0.36
Prob. of divorce	ψ	0.01	Capital depreciation	δ	0.1
Risk aversion	σ	1.5	Wage persistence (co)	ρ^{co}	0.969
Inverse Frisch elast.	γ^f	1	Wage persistence (nc)	ρ^{nc}	0.928
Inverse Frisch elast.	γ^m	3	Wage volatility (co)	σ_ϵ^{co}	0.100
Fraction college (f)	$q^{f,co}$	0.42	Wage volatility (nc)	σ_ϵ^{nc}	0.139
Fraction college (m)	$q^{m,co}$	0.41	Cross-spouse corr.	ϱ	0.150
Pareto weight	μ	0.5			

Go back

Table 3. Parameters set internally

Description	Param.	Value	Moment	Target	Model
Discount factor	β	0.983	Capital-output ratio	3.00	3.02
Utility weight (f)	φ_h^f	2.26	Hours worked females	0.26	0.26
Utility weight (m)	φ_h^m	16.6	Hours worked males	0.35	0.35
Bequest util (no desc)	φ_b^0	4.70	Bequest-wealth ratio (%)	0.88	0.88
Bequest util (desc)	φ_b^1	30.2	Wealth differential 73+	0.20	0.20
Bequest util	φ_b^{lux}	1.60	90th perc bequest distr	4.34	4.52
Gender premium	θ	0.56	Gender wage gap	0.78	0.78
College premium	ξ^{co}	0.54	College wage gap	1.74	1.74
Marriage utility	χ^{nc}	0.81	Frac married nc HH	0.57	0.57
Marriage utility	χ^{co}	0.75	Frac married co HH	0.66	0.66
Prob. descendants	$\pi^{\mathcal{S},nc}$	0.04	Frac with desc single nc	0.77	0.77
Prob. descendants	$\pi^{\mathcal{S},co}$	0.02	Frac with desc single co	0.68	0.69
Prob. descendants	$\pi^{\mathcal{M}}$	0.08	Frac with desc married	0.95	0.94

▸ Go back