Optimal Income Taxation: Mirlees Meets Ramsey

by

Jonathan Heathcote and Hitoshi Tsujiyama

Discussion

by

Nezih Guner

(ICREA-MOVE, UAB and Barcelona GSE)

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What the authors do?

- What structure of income taxation can maximize the social benefits of redistribution and public insurance while minimizing the social harm associated with distorting the allocation of labor input?

- Evaluate alternative policies using a social welfare function designed to capture the taste for redistribution reflected in the current tax system.

- The optimal tax policy in the affine class is welfare reducing, while moving to the optimal fully non-linear Mirrlees policy generates only tiny welfare gains.
    - Tagging (taxes conditional on observables) help

- Static
- Preferences

$$U(c,h) = \log(c) - \frac{h^{1+\sigma}}{1+\sigma} \text{ where } \frac{1}{\sigma} = \text{Frisch elasticity}$$

- Aggregate resources

$$Y = \int w_i h_i di = \int c_i d_i + G$$

- Wages

$$\ln(w_i) = \alpha_i + \kappa_i + \varepsilon_i$$

  - α_i : uninsurable, unobservable by planner
  - κ_i : uninsurable, observable by planner
  - ε_i : insurable by agents

Planner

- Wants to maximize a social welfare function $W(\alpha, \kappa)$
- Takes G and private insurance as given
- First best: planner observes α, κ, and ε
- Second Best (Mirrlees): α and ε are private, no restrictions on the tax functions
- Third Best (Ramsey): α and ε are private, restricted tax functions

- Baseline tax system

$$T(y, \lambda, \tau) = y - \lambda y^{1-\tau}$$

- Empirically motivated social welfare function

$$W(\alpha, \kappa) = \exp(-\theta(\alpha + \kappa))$$

  - One parameter controls taste for redistribution

- Suppose a planner chooses λ and τ.
- What value of θ would justify observed τ?
- Given this particular value of θ, solve Mirrlees and Ramsey.
  - For Ramsey, consider

$$T(y) = \tau_0 + \tau_1 y$$

Benchmark Tax Function

- Two-parameter tax function

$$T(y) = y - \lambda y^{1-\tau}$$

- Average taxes

$$\tau(y) = 1 - \lambda y^{-\tau}$$

  - $\tau = 0, \tau(y) = 1 - \lambda$
  - $\tau > 0$, average tax rate increases with income

- Marginal taxes

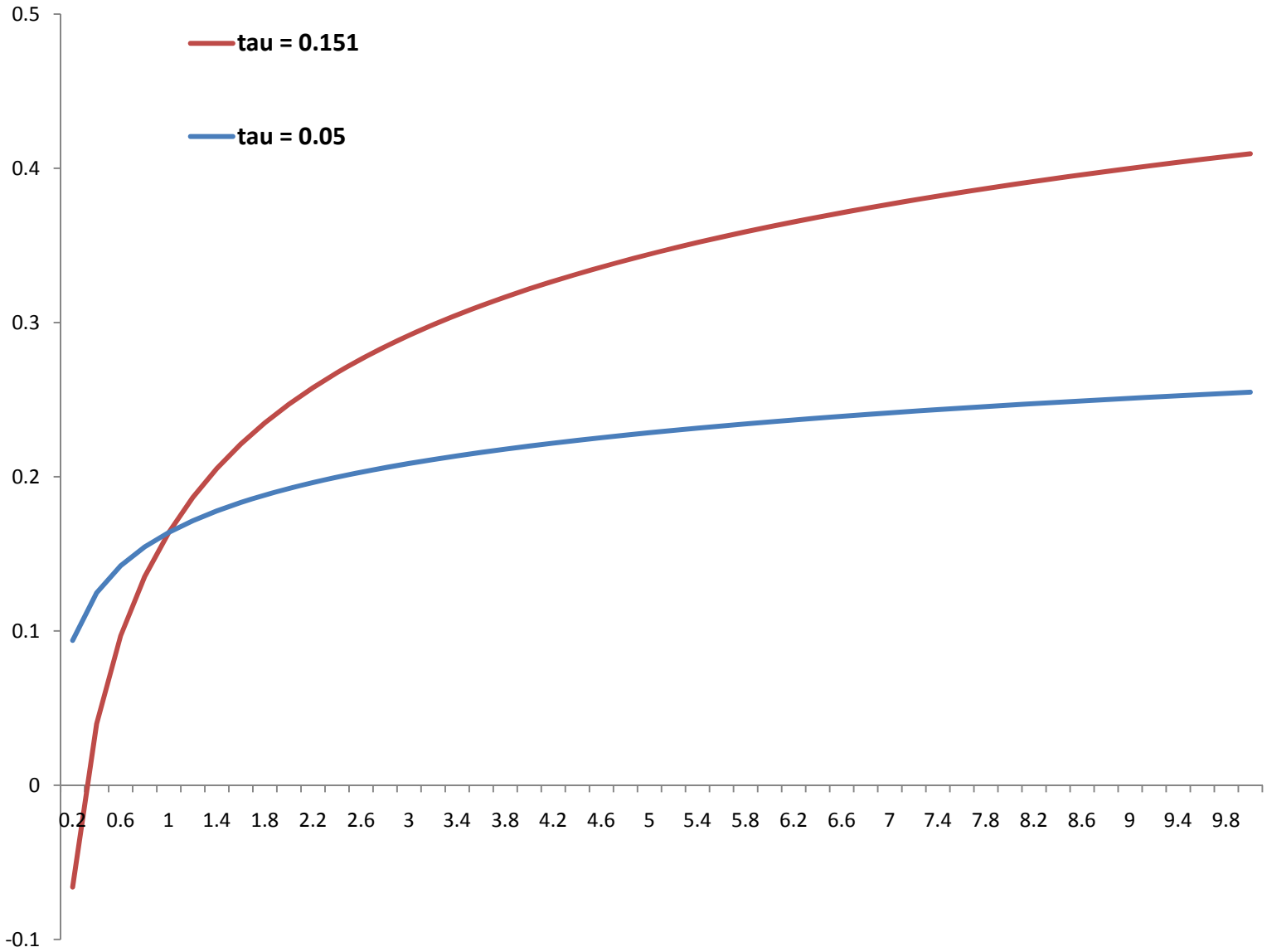
$$m(y) = 1 - \lambda(1 - \tau)y^{-\tau}$$

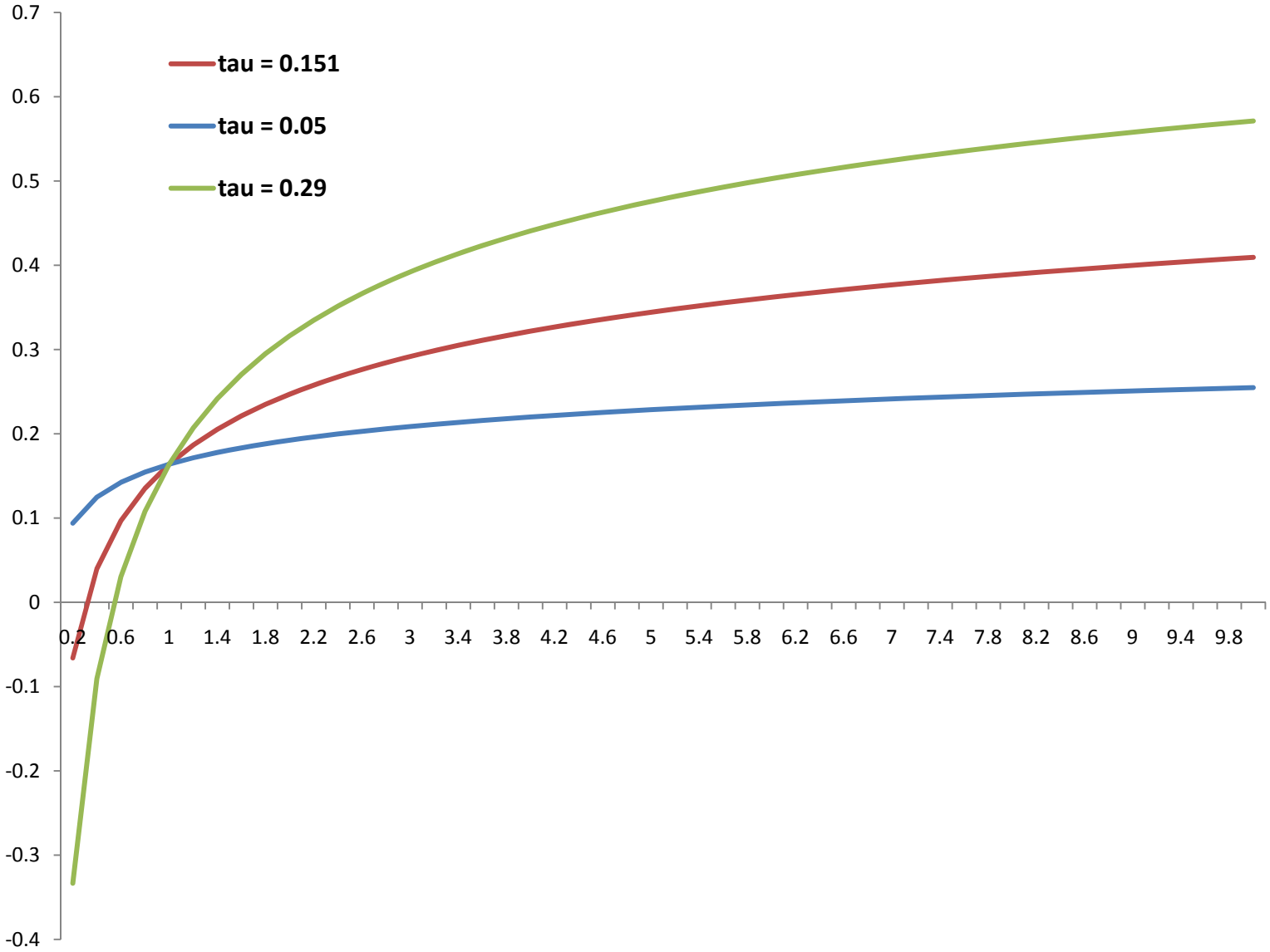
- Let y be normalized income, i.e. $y = 1$ is the average income

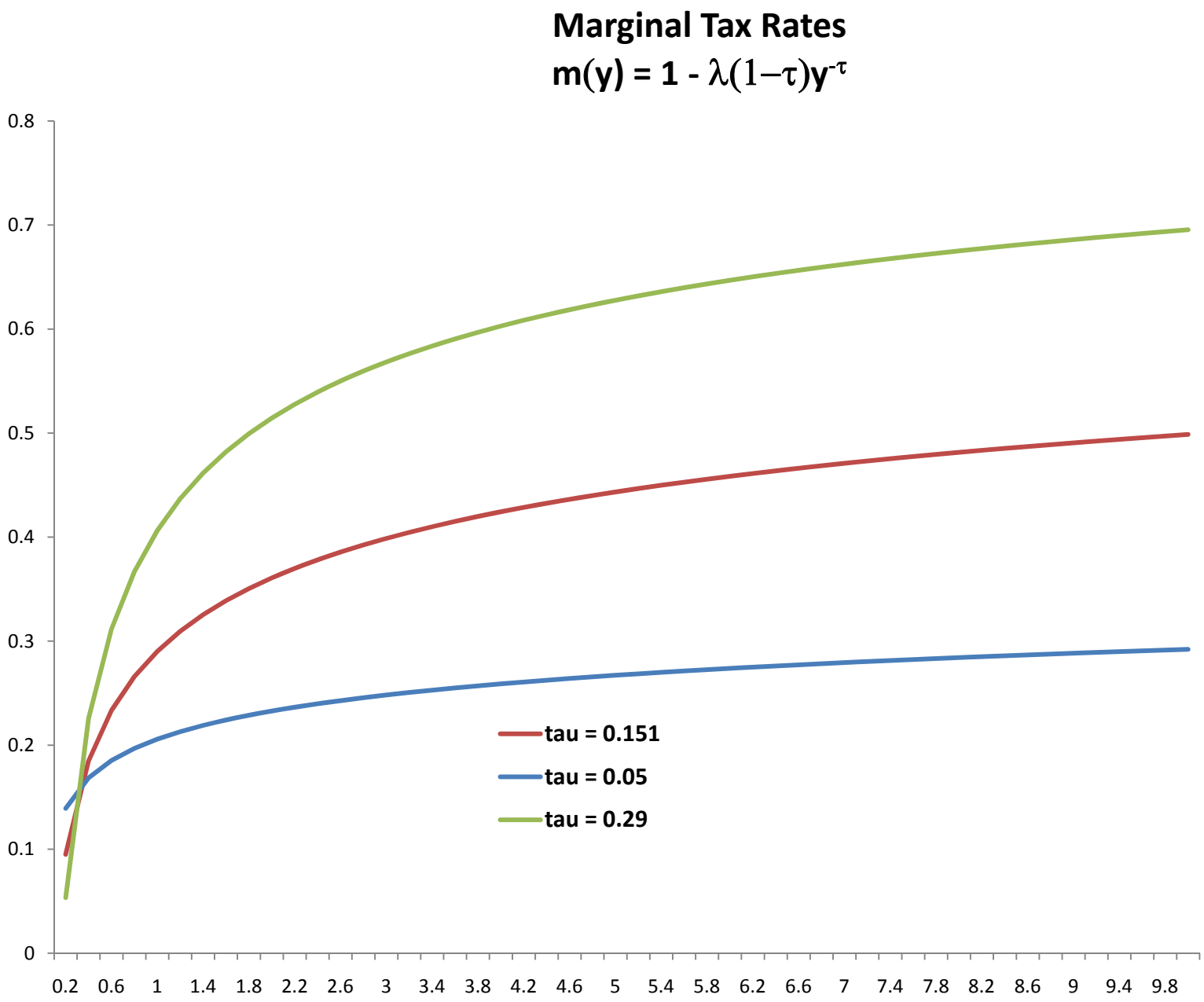
$$\tau(1) = 1 - \lambda \text{ and } m(1) = 1 - \lambda(1 - \tau)$$

- $\lambda = 0.836$, $\tau = 0.151$

$$\tau(1) = 0.164 \text{ and } m(1) = 0.29$$

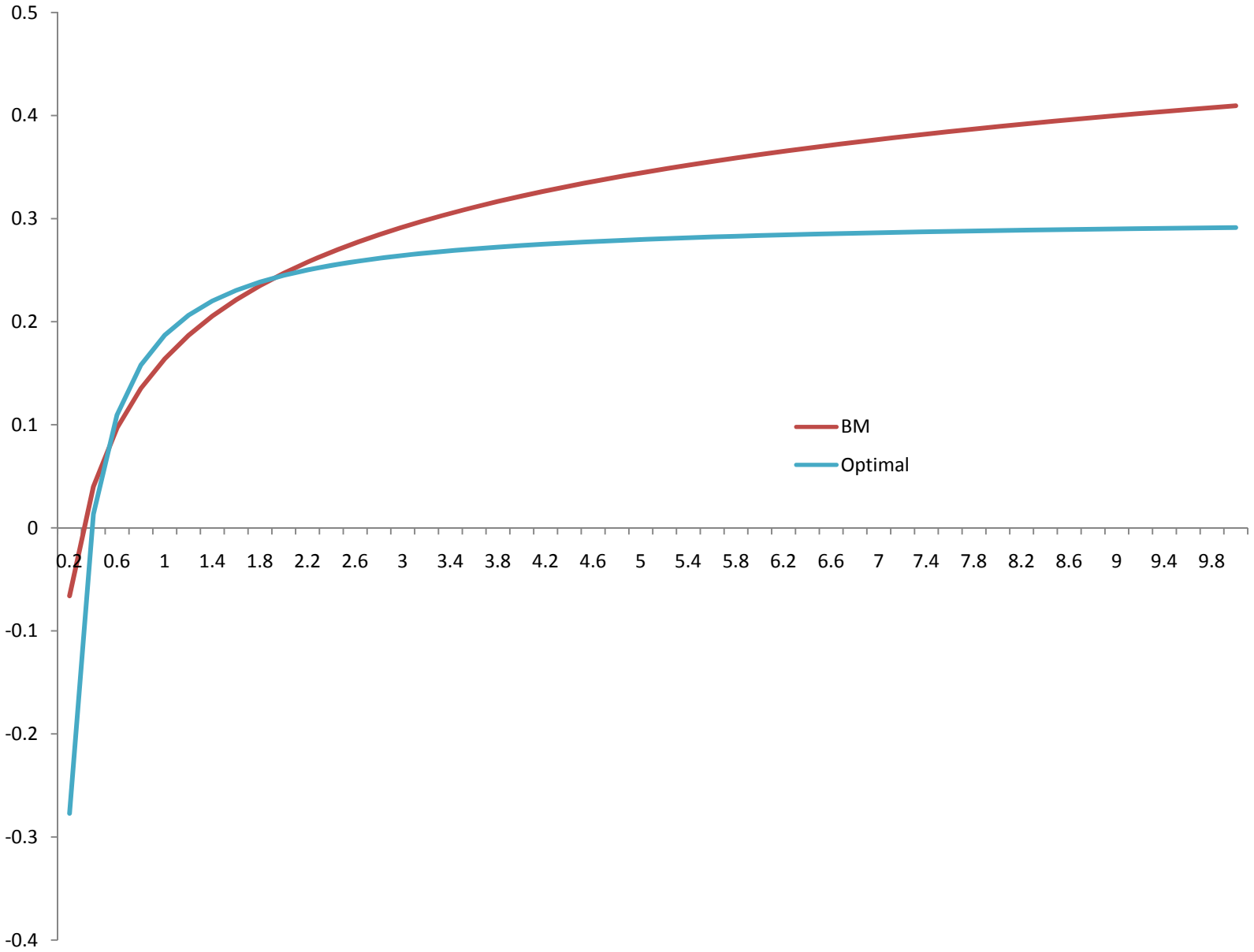

Average Tax Rates
τ(y) = 1 - λy^-τ
tau = 0.151
tau = 0.05
0.5
0.4
0.3
0.2
0.1
0
-0.1
0.2
0.6
1
1.4
1.8
2.2
2.6
3
3.4
3.8
4.2
4.6
5
5.4
5.8
6.2
6.6
7
7.4
7.8
8.2
8.6
9
9.4
9.8


Average Tax Rates
τ(y) = 1 - λy^-τ
tau = 0.151
tau = 0.05
tau = 0.29
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
0.2
0.6
1
1.4
1.8
2.2
2.6
3
3.4
3.8
4.2
4.6
5
5.4
5.8
6.2
6.6
7
7.4
7.8
8.2
8.6
9
9.4
9.8


Marginal Tax Rates
m(y) = 1 - λ(1−τ)y^-τ
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0.2 0.6 1 1.4 1.8 2.2 2.6 3 3.4 3.8 4.2 4.6 5 5.4 5.8 6.2 6.6 7 7.4 7.8 8.2 8.6 9 9.4 9.8
tau = 0.151
tau = 0.05
tau = 0.29

- Moving to an affine tax function is welfare reducing!
- Gains from Mirrleesian taxes are tiny!
- No need for transfers

Taxes		Welfare	Y	mar. rate	TR/Y
US					
$\lambda = 0.836$	$\tau = 0.151$			0.311	0.018
Affine		-0.58	0.41	0.303	0.089
$\tau_0 = -0.116$	$\tau_1 = 0.303$				
Mirrlees		0.11	0.82	0.287	0.003

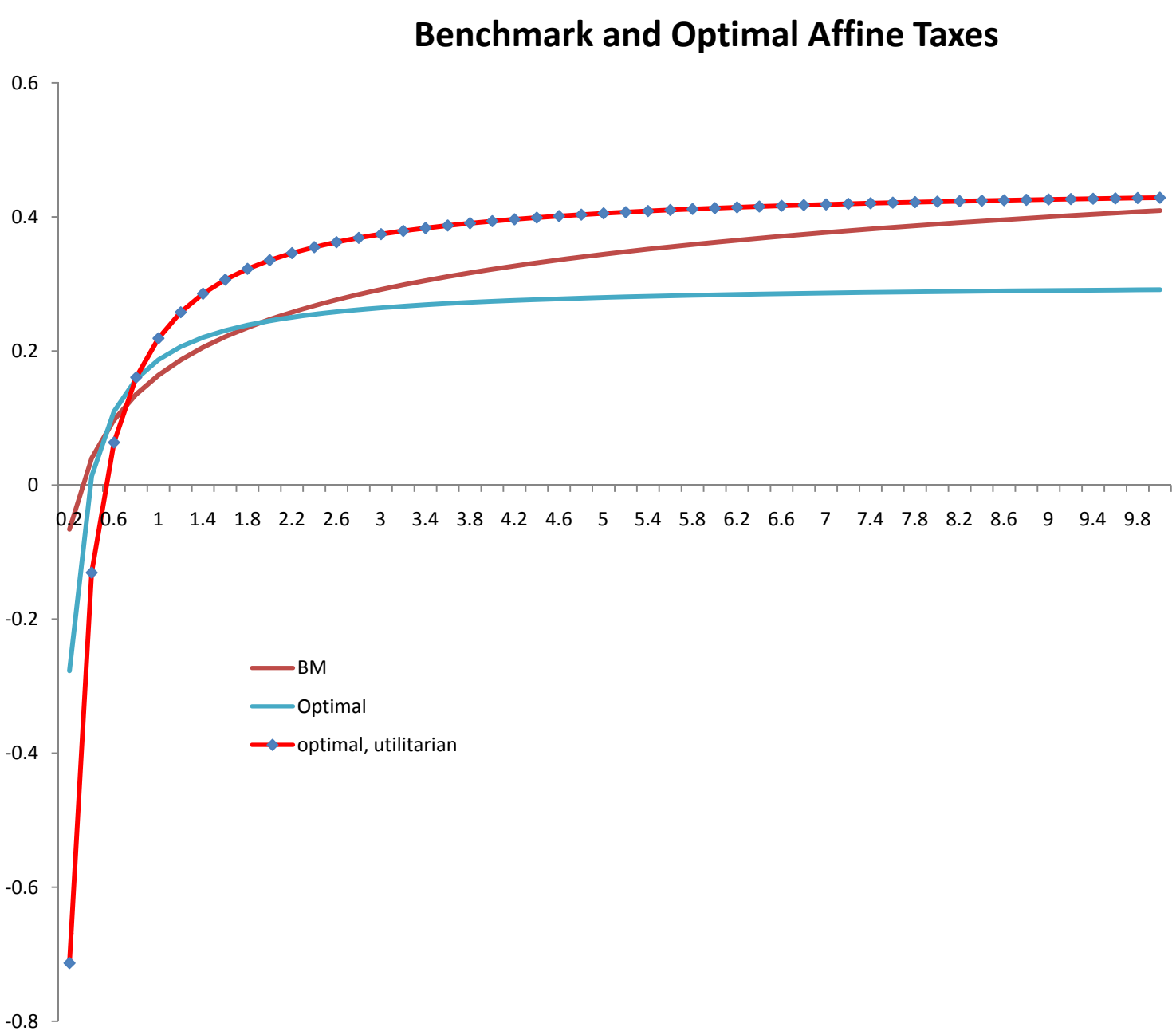

Benchmark and Optimal Affine Taxes
0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
0.2
0.6
1
1.4
1.8
2.2
2.6
3
3.4
3.8
4.2
4.6
5
5.4
5.8
6.2
6.6
7
7.4
7.8
8.2
8.6
9
9.4
9.8
BM
Optimal

What is going on?

- Consider a utilitarian welfare function

Taxes		Welfare	Y	mar. rate	TR/Y
US					
$\lambda = 0.836$	$\tau = 0.151$			0.311	0.018
Optimal US					
$\lambda = 0.826$	$\tau = 0.295$	1.38	-6.02	0.436	0.068
Affine					
$\tau_0 = -0.233$	$\tau_1 = 0.452$	0.45	-6.43	0.452	0.220
Mirrlees		1.53	-6.15	0.440	0.122

- Empirically motivated welfare function matters!
- Planner likes high productivity people.


Benchmark and Optimal Affine Taxes
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
0.2
0.6
1
1.4
1.8
2.2
2.6
3
3.4
3.8
4.2
4.6
5
5.4
5.8
6.2
6.6
7
7.4
7.8
8.2
8.6
9
9.4
9.8
BM
Optimal
optimal, utilitarian

What is going on?

- Lower inequality, thin right tail

Taxes		Welfare	Y	mar. rate	TR/Y
US					
$\lambda = 0.836$	$\tau = 0.151$			0.311	0.018
Optimal US					
$\lambda = 0.826$	$\tau = 0.070$	0.27	3.1	0.239	-0.005
Affine					
$\tau_0 = -0.068$	$\tau_1 = 0.250$	0.34	2.67	0.250	0.042
Mirrlees		0.35	2.71	0.249	0.042

- Right tail matters, more revenue at the top!
- But, how elastic taxable income — Mertens (2014)
- Guner, Daneri, Ventura (2014), little room to raise revenue by making taxes more progressive.

Comments - Road Map

- Taxes and tax functions
- Welfare function
- Tagging
- Demand for redistribution

Inequality and Taxes Paid in the US

Guner, Kaygusuz and Ventura (RED, forthcoming)

- IRS Micro tax data
  - no top coding
- Household income and taxes paid
- Estimate effective tax functions

Inequality and Taxes Paid in the US

Guner, Kaygusuz and Ventura (RED, forthcoming)

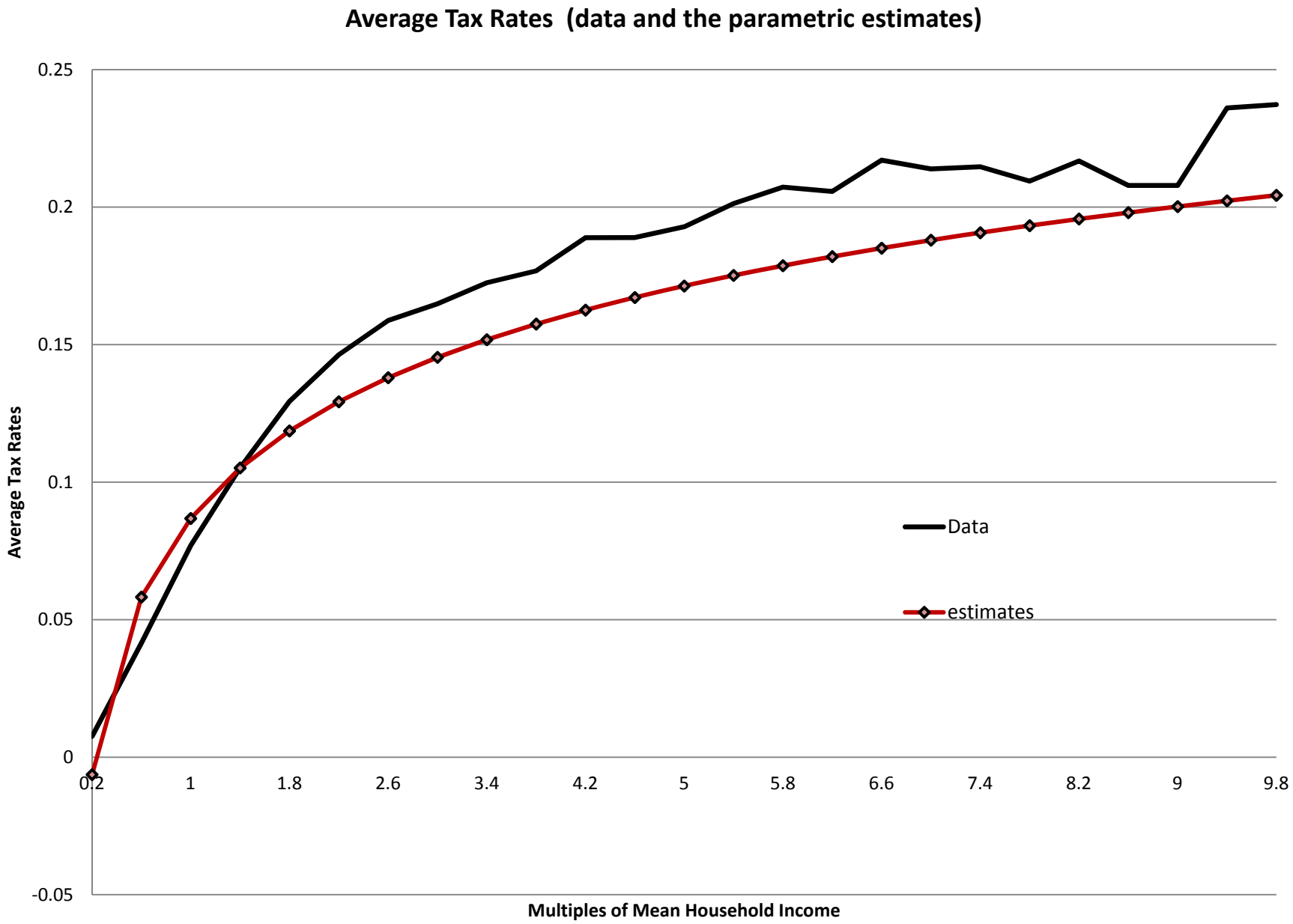
Distribution of Income and Tax Liabilities

Percentiles	Income	Labor Income	Taxes Paid
Bottom			
1%	0.0%	0.0%	0.0%
1-5%	0.1%	0.1%	0.0%
5-10%	0.4%	0.4%	0.0%
Quantiles			
1st	2.0%	2.1%	0.3%
2nd	6.2%	6.7%	1.8%
3rd	11.3%	12.3%	5.7%
4th	19.2%	21.3%	13.1%
5th	61.4%	57.6%	79.2%
Top			
90-95%	10.6%	11.7%	11.2%
95-99%	15.0%	14.8%	19.4%
1%	20.9%	14.3%	35.7%

Tax Rate Distribution

Statistic	All Households
% with zero tax liability	24.7%
Median Tax rate	7.3%
Mean Tax rate	7.4%
Tax Rate at	
80th Percentile	12.3%
90th Percentile	15.9%
95th Percentile	18.5%
99th Percentile	25.4%

- What is the relation between income and taxes paid in the micro data?
- Our estimate is $\tau = 0.053$


Average Tax Rates (data and the parametric estimates)
0.25
0.2
0.15
0.1
0.05
0
-0.05
Average Tax Rates
0.2
1
1.8
2.6
3.4
4.2
5
5.8
6.6
7.4
8.2
9
9.8
Multiples of Mean Household Income
Data
estimates

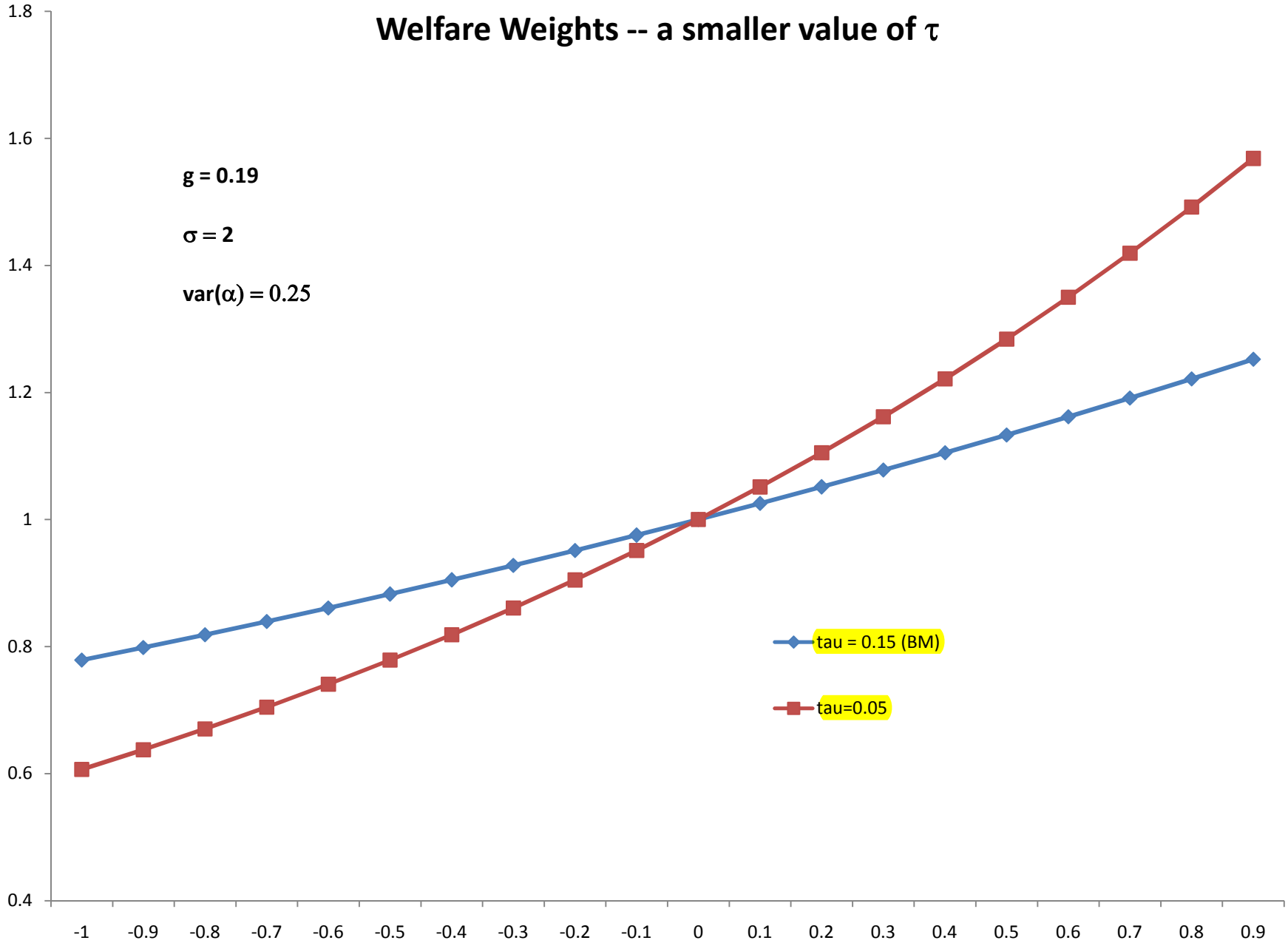
Social Welfare Function

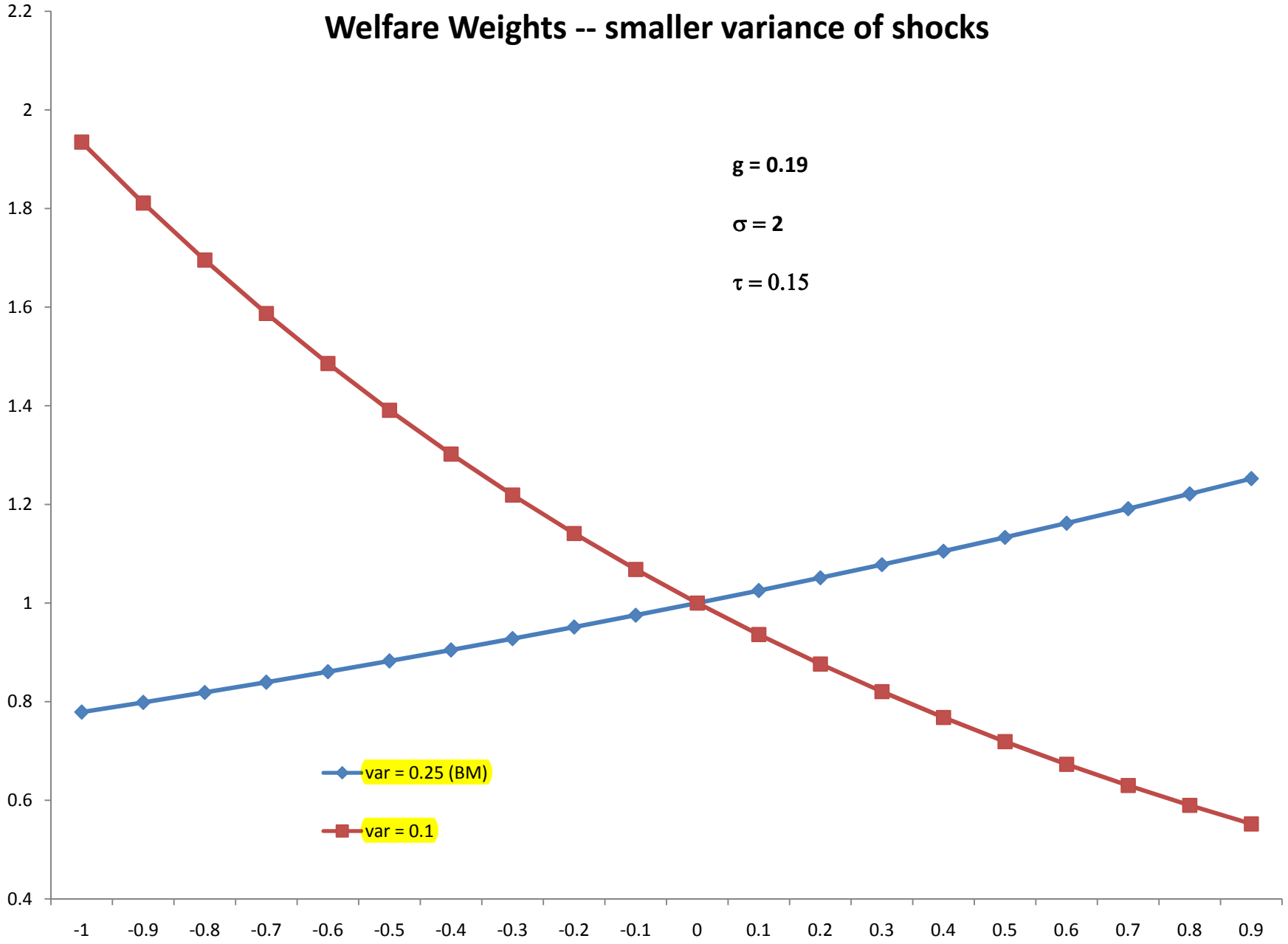
- Remember
$$\ln(w_i) = \alpha_i + \kappa_i + \varepsilon_i$$
- Remember
$$W(\alpha, \kappa) = \exp(-\theta(\alpha + \kappa))$$
- For a simplified version of the model

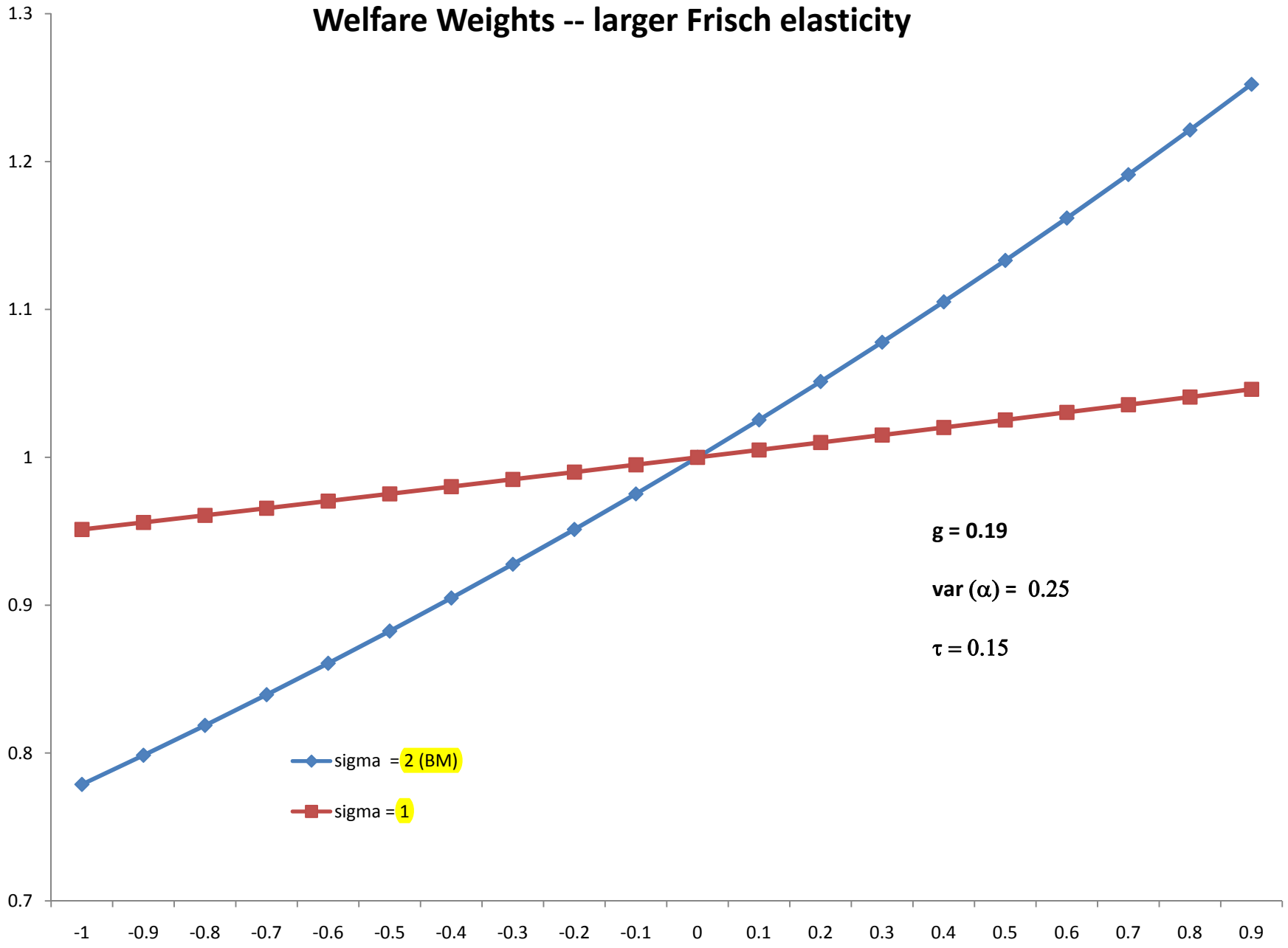
$$\theta = -(1-\tau) + \frac{1}{(v_\alpha + v_\kappa)} \frac{1}{(1+\sigma)} \left[\frac{1}{(1-g)(1-\tau)} - 1 \right]$$

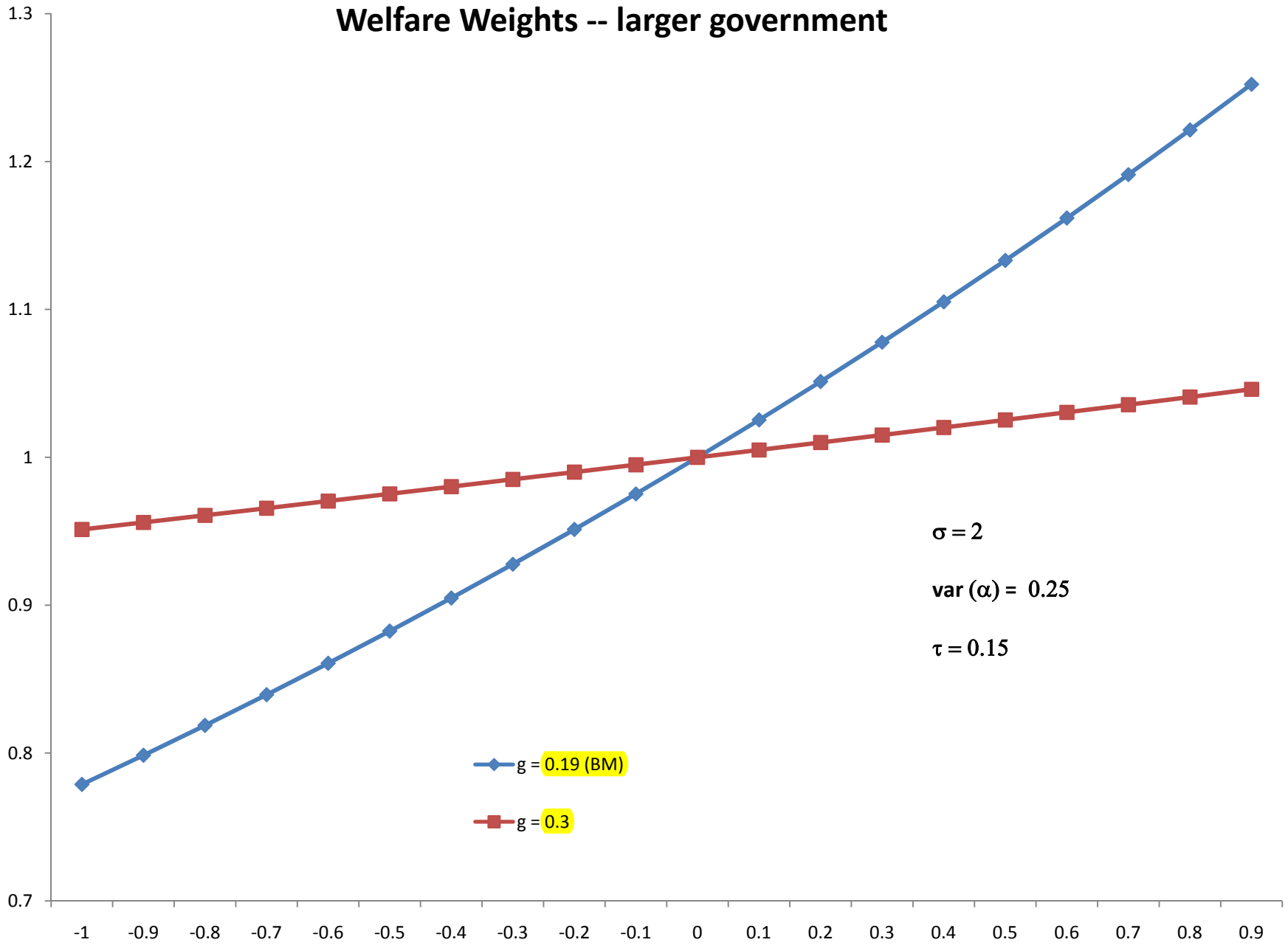
- Benchmark parameters

$$\tau = 0.151, \;\; v_\alpha + v_\kappa = 0.25, \;\; \sigma = 2, \;\; g = 0.19$$


Welfare Weights -- a smaller value of τ
g = 0.19
σ = 2
var(α) = 0.25
tau = 0.15 (BM)
tau=0.05
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
-1
-0.9
-0.8
-0.7
-0.6
-0.5
-0.4
-0.3
-0.2
-0.1
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9


Welfare Weights -- smaller variance of shocks
g = 0.19
σ = 2
τ = 0.15
var = 0.25 (BM)
var = 0.1
2.2
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
-1
-0.9
-0.8
-0.7
-0.6
-0.5
-0.4
-0.3
-0.2
-0.1
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9


Welfare Weights -- larger Frisch elasticity
1.3
1.2
1.1
1
0.9
0.8
0.7
-1
-0.9
-0.8
-0.7
-0.6
-0.5
-0.4
-0.3
-0.2
-0.1
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
g = 0.19
var (α) = 0.25
τ = 0.15
sigma = 2 (BM)
sigma = 1


Welfare Weights -- larger government
1.3
1.2
1.1
1
0.9
0.8
0.7
-1
-0.9
-0.8
-0.7
-0.6
-0.5
-0.4
-0.3
-0.2
-0.1
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
σ = 2
var (α) = 0.25
τ = 0.15
g = 0.19 (BM)
g = 0.3

Tagging

- Taxing on observables – large welfare gains
- Incentives problems
  - Taxing on the educational attainments!
- What do we know?
  - Alessina, Ichino and Karabarbounis (AEJ-EP, 2011) , gender based taxation
  - Guner, Kaygusuz and Ventura (JME, 2012), welfare losses from gender-based taxation in an quantitative model

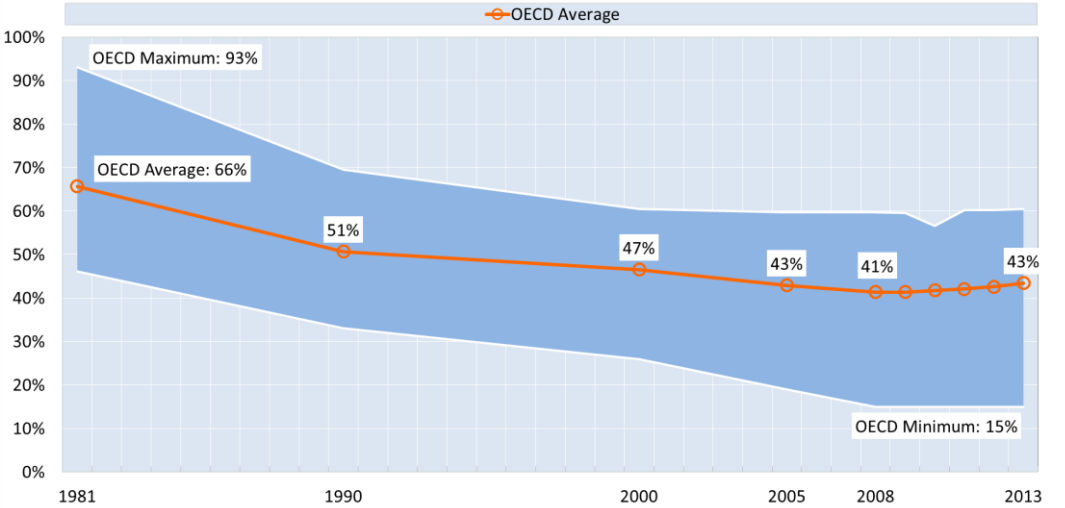
Demand for Redistribution

- Inequality has been increasing
- Basic political economy models would suggest that the demand for redistribution would increase
- But top marginal tax rates have been falling

role of stock options in top executives' remuneration.

5 Until the crisis, top income tax rates were falling rapidly

Top statutory personal income tax rates in the OECD area, maximum, minimum and average, 1981 to 2013



Source: OECD (2012), *Taxing Wages*, and OECD CTPA tax statistics.

Demand for Redistribution

- Inequality has been increasing
- Basic political economy models would suggest that the demand for redistribution would increase
- But top marginal tax rates have been falling
- No much demand for redistribution

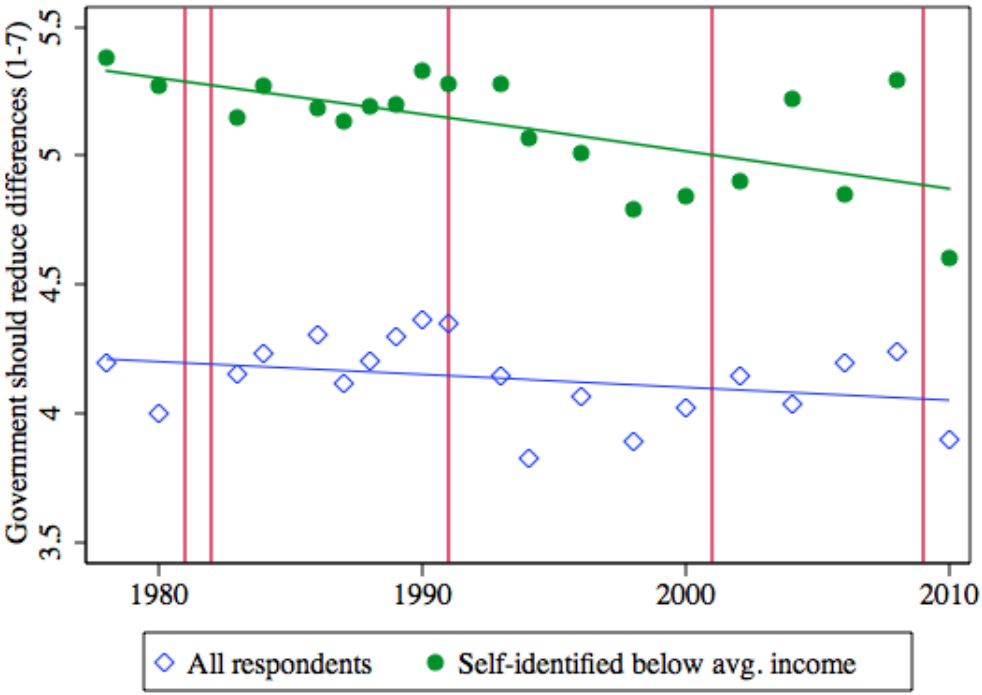


Figure 1: The government should reduce income differences (scale from 1–7, GSS)

This figure depicts responses since 1978 in the US General Social Survey (GSS) on whether the government should reduce income differences. The empty diamond series is for all respondents while the full circle series if for respondents with below average income. Regression fits are depicted for each series. The graph uses the *eqwlth* variable from the GSS (though subtracts it from eight so that it is increasing in support for redistribution).

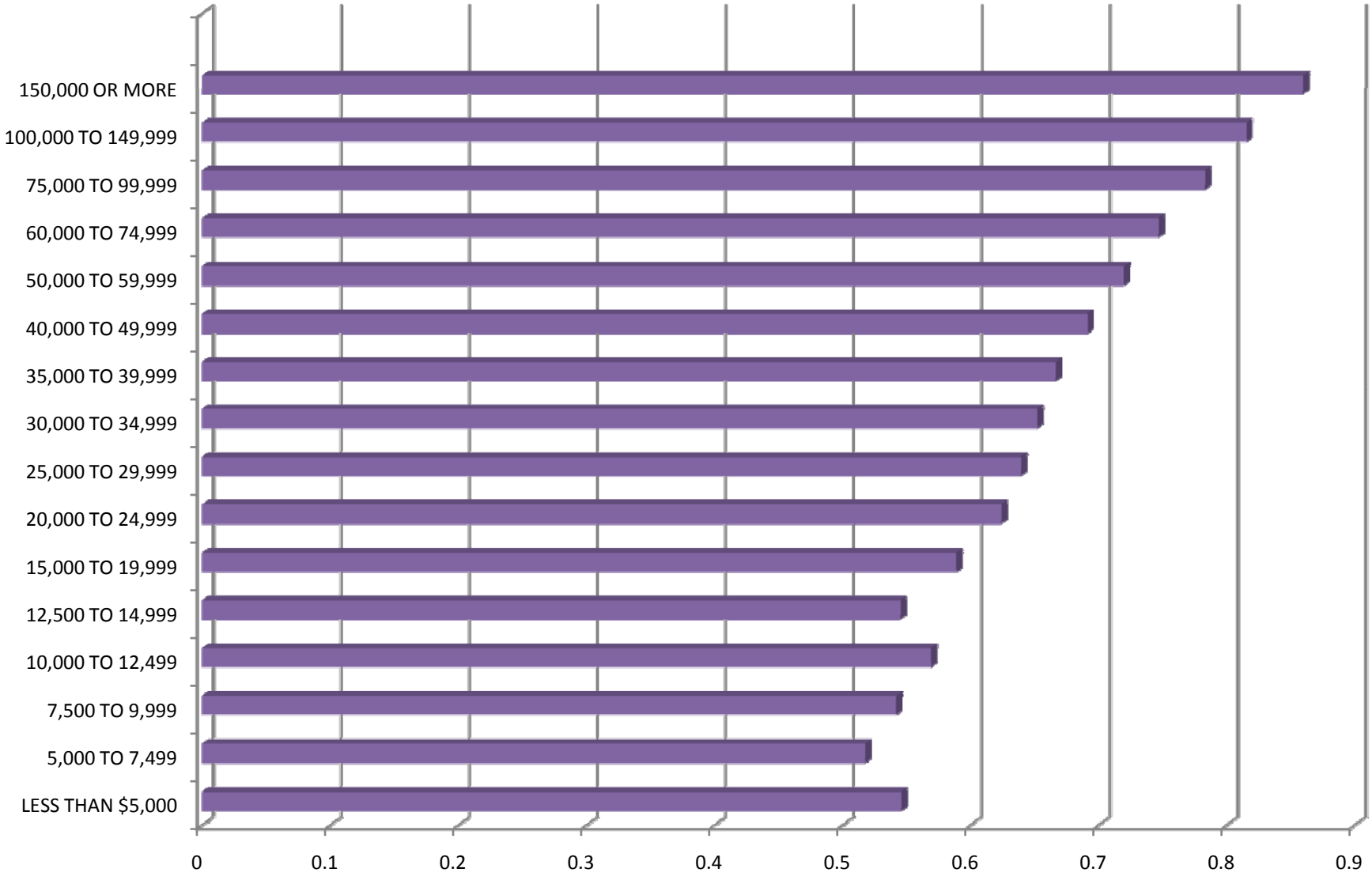
Demand for Redistribution

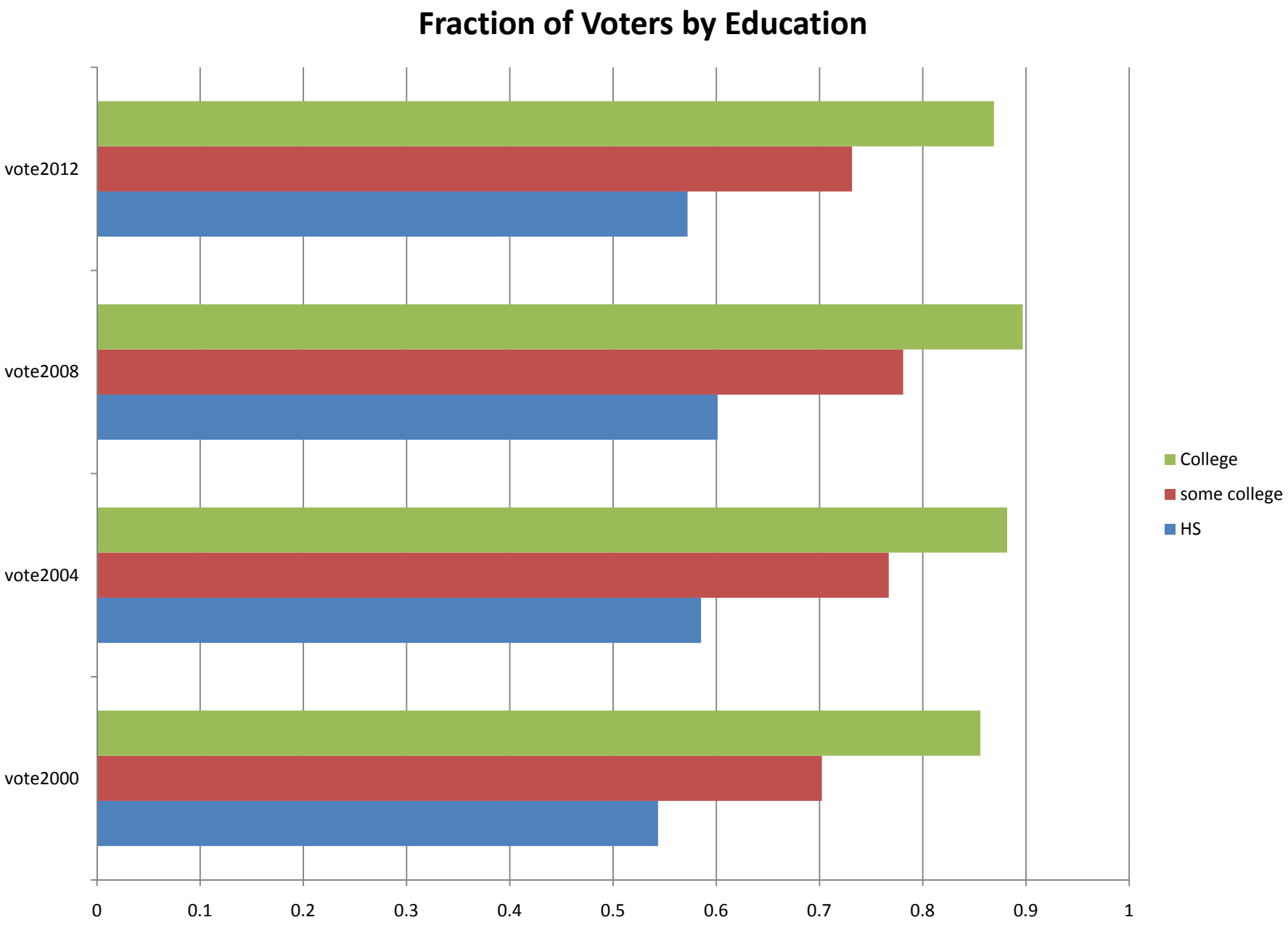
- Inequality has been increasing
- Basic political economy models would suggest that the demand for redistribution would increase
- But top marginal tax rates have been falling
- No much demand for redistribution
- People do not know about inequality.
- People do not care about inequality.

Demand for Redistribution – Who votes?

- Rich and educated.
- Why?

Fraction of Voters by Household Income in 2012 Presidential Election




Fraction of Voters by Education
vote2012
vote2008
vote2004
vote2000
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
College
some college
HS

Demand for Redistribution – Why don't people want it?

- Kuziemko, Norton, Saez and Stantcheva (2013), "How elastic are preferences for redistribution?"
- Randomized survey experiments
- Inform people about inequality and redistribution (minimum wage, EITC etc.).
- Information on inequality helps, i.e. people become concerned about it.
- Still, little/no effect on demand for redistribution (except the estate tax).
- Why?
  - Very low trust on government.
  - American dream!

Final Comments

- Lots of food for thought!
- How robust are the results?
- The paper calls for a political economy extension.