

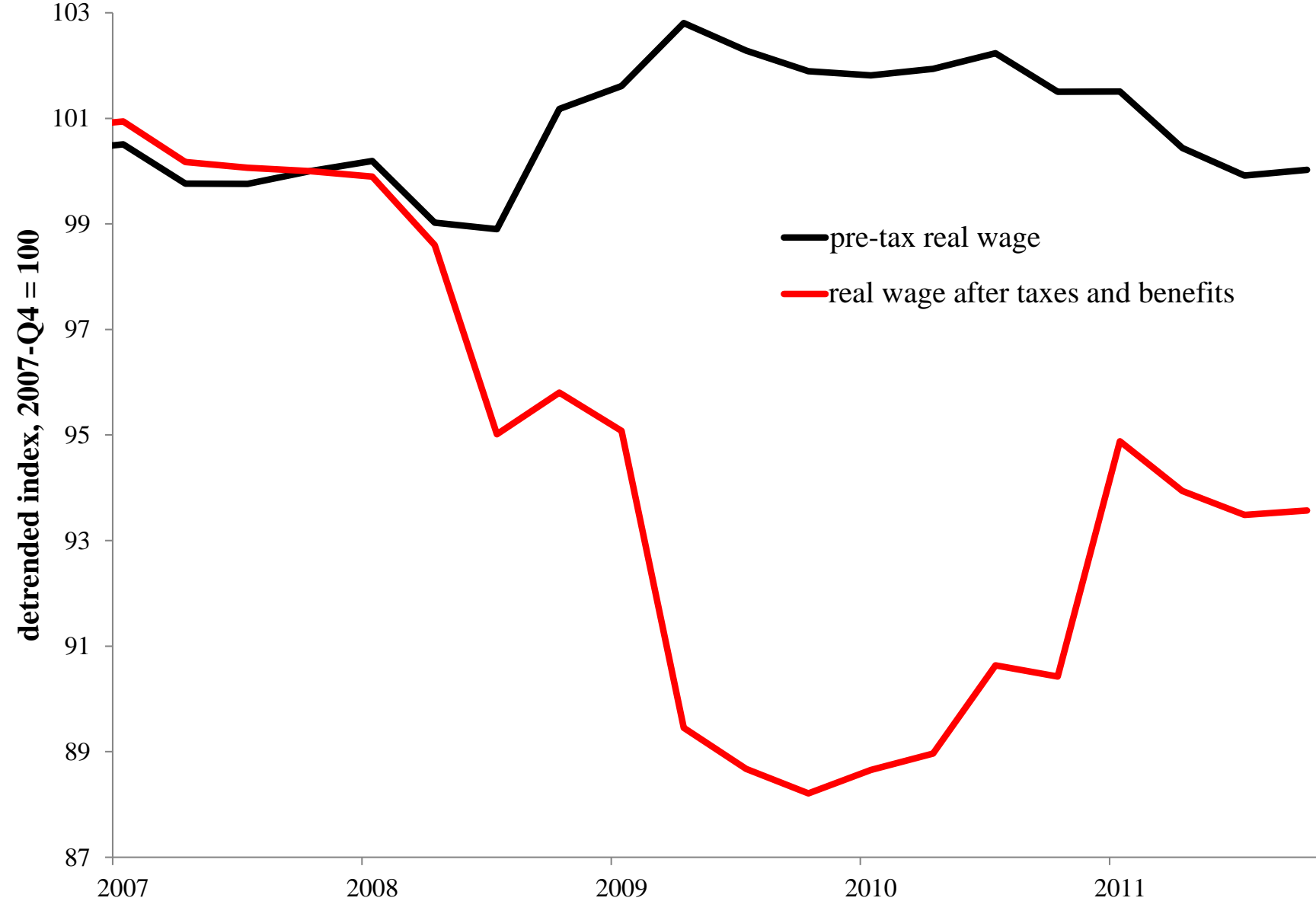
# Uncertainty, Redistribution, and the Labor Market

February 2013

# Uncertainty and the Labor Market: Mechanisms

- “Labor demand”: uncertainty pushes real wages lower
  - v1. Reduced investment → people who make investment goods have fewer jobs
  - v1 liberal BOE: attribute entire investment drop – \$2k per capita = 4% of GDP – to heightened uncertainty. But 4% drop in labor demand only reduces labor by about 1%, while actual labor fell almost 10%
  - v2. employers perceive a new cost of employment in addition to employee compensation (e.g., probability of new employer tax)
  - v3. uncertainty affects markup behavior
- “Labor supply”
  - precautionary savings motive: pushes real wages lower
  - **increased demand for social insurance:**
    - **reduces after-tax wages and**
    - **(in the short term) raises pre-tax wages**

## After-tax Real Wages Fell Sharply, and Remain Low



# Principal-Agent Model

- Holmstrom and Milgrom (1987), Rosen (1982), Garen (1994)
- Worker's output =  $y = n + v + \varepsilon$ 
  - $n$  = effort
  - $v$  = random factor, public information
  - $\varepsilon$  = random factor, private information
- $v$  and  $\varepsilon$  are idiosyncratic risks but their relative importance may change over time
- After full-information insurance, workers are left with  $y - v = n + \varepsilon$
- Social insurance at rate  $(1-\mu)$ , so disposable income is
$$c = \mu \varepsilon + \mu n + b$$
- $b$  is the guaranteed minimum income.  $\mu$  is “self-reliance rate”
- social insurance budget constraint
$$b = (1-\mu)N$$
- where  $N$  is average effort

# Principal-Agent Model (cont'd)

- Equilibrium defined for given  $\mu$ :
  - Individual effort  $n$  maximizes expected utility, taking  $N$  and  $\mu$  as given

$$\int u \left( \mu n + \mu \varepsilon + (1 - \mu)N - \gamma \frac{\eta}{\eta + 1} n^{(\eta + 1)/\eta} \right) dG(\varepsilon)$$

where the constant  $\eta > 0$  is the wage elasticity of effort.  $\gamma, u' > 0, u'' < 0,$

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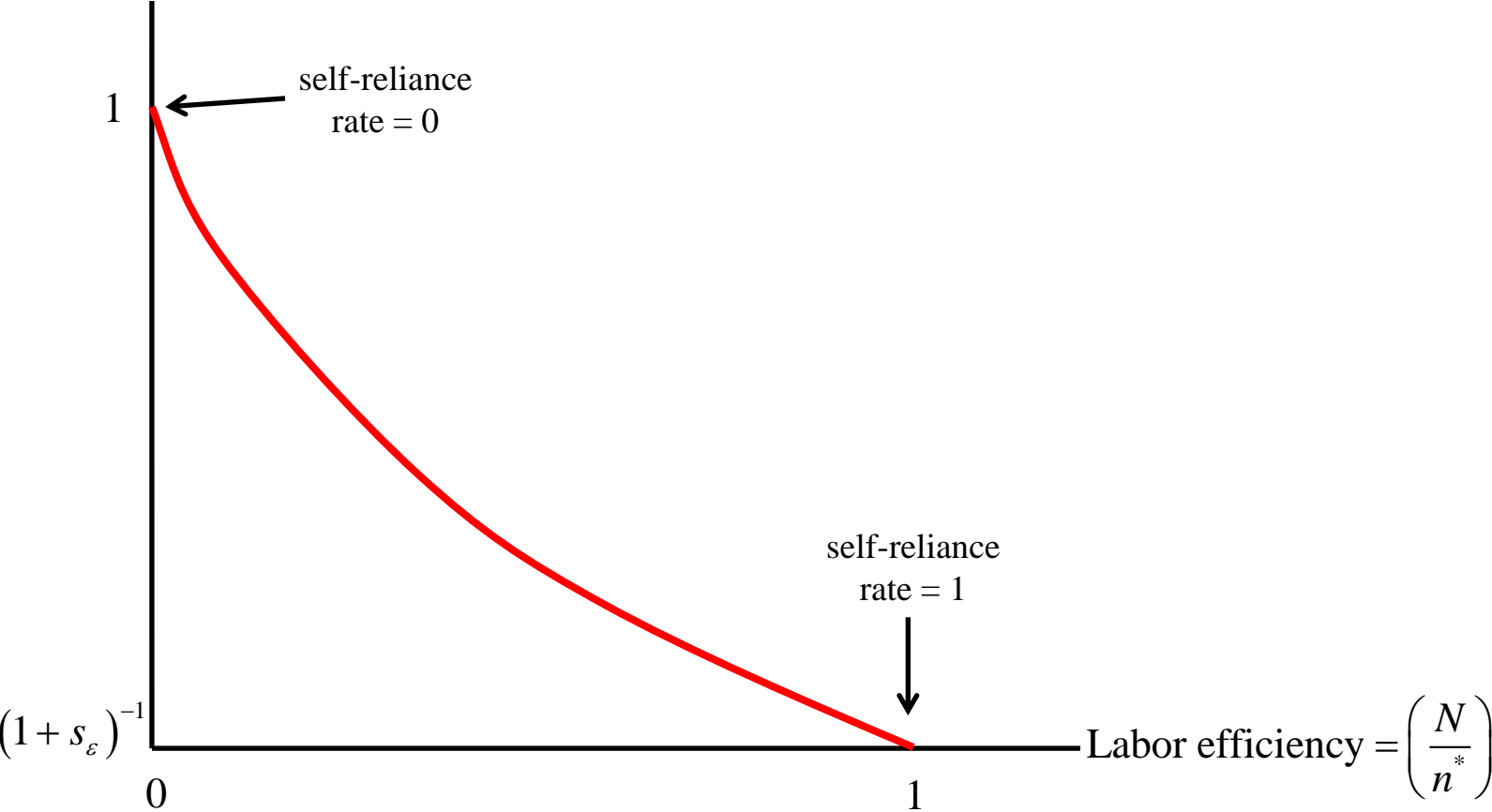
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- Safety  $S$  defined as a monotone decreasing function of the variance of disposable income  $c$

$$S \equiv \frac{1}{1 + s_c} = \frac{1}{1 + s_\varepsilon \left( \frac{N}{n^*} \right)^{1/\eta}}$$

- Safety-efficiency tradeoff is the locus of equilibria in the [efficiency, safety] plane: one for each degree of social insurance

**Figure 1. The Equity-Efficiency Frontier**

$$\text{Safety} = (1+s_c)^{-1}$$





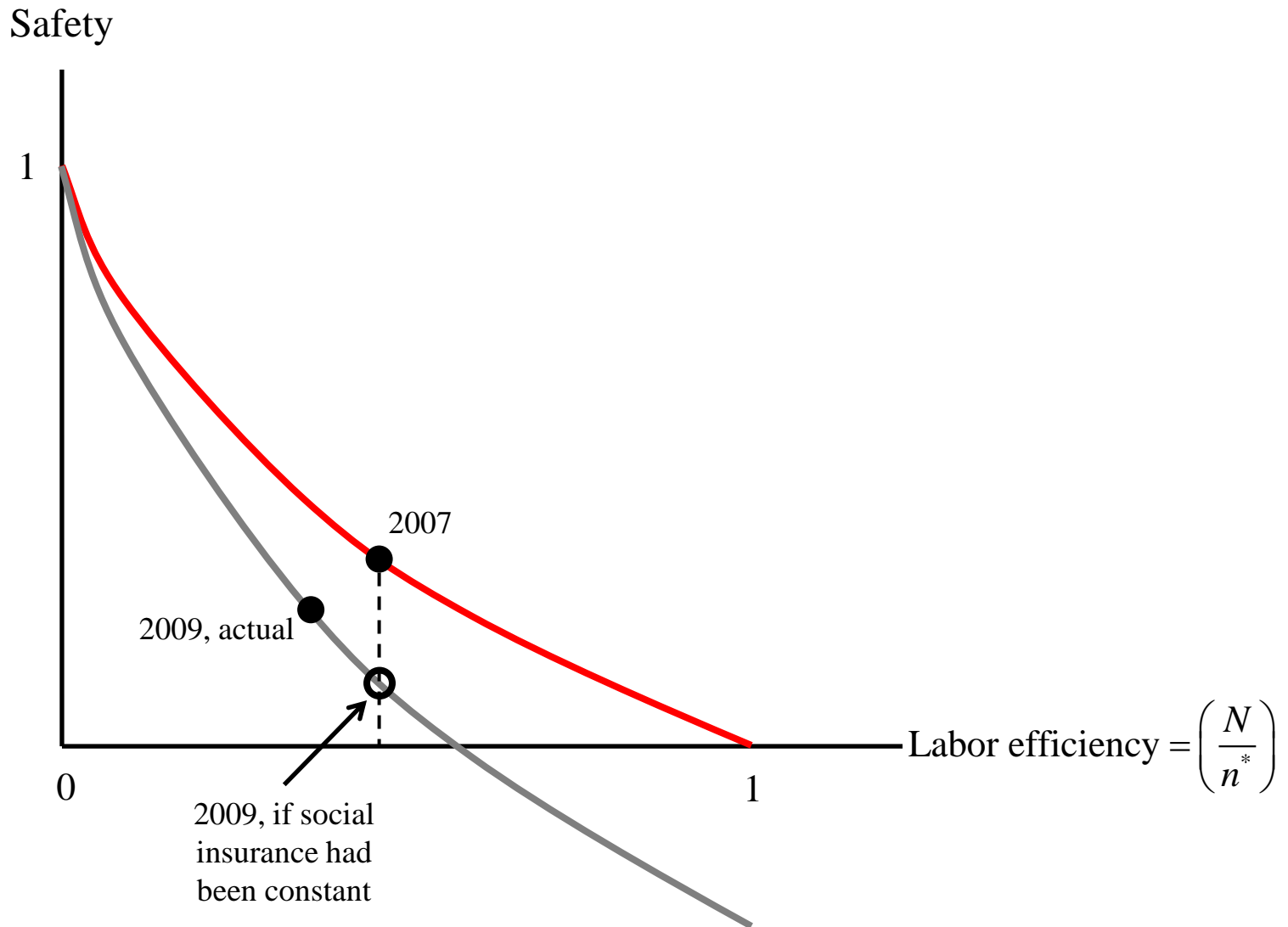
# Optimal Social Insurance

- Equilibrium expected utility, for given  $\mu$ :

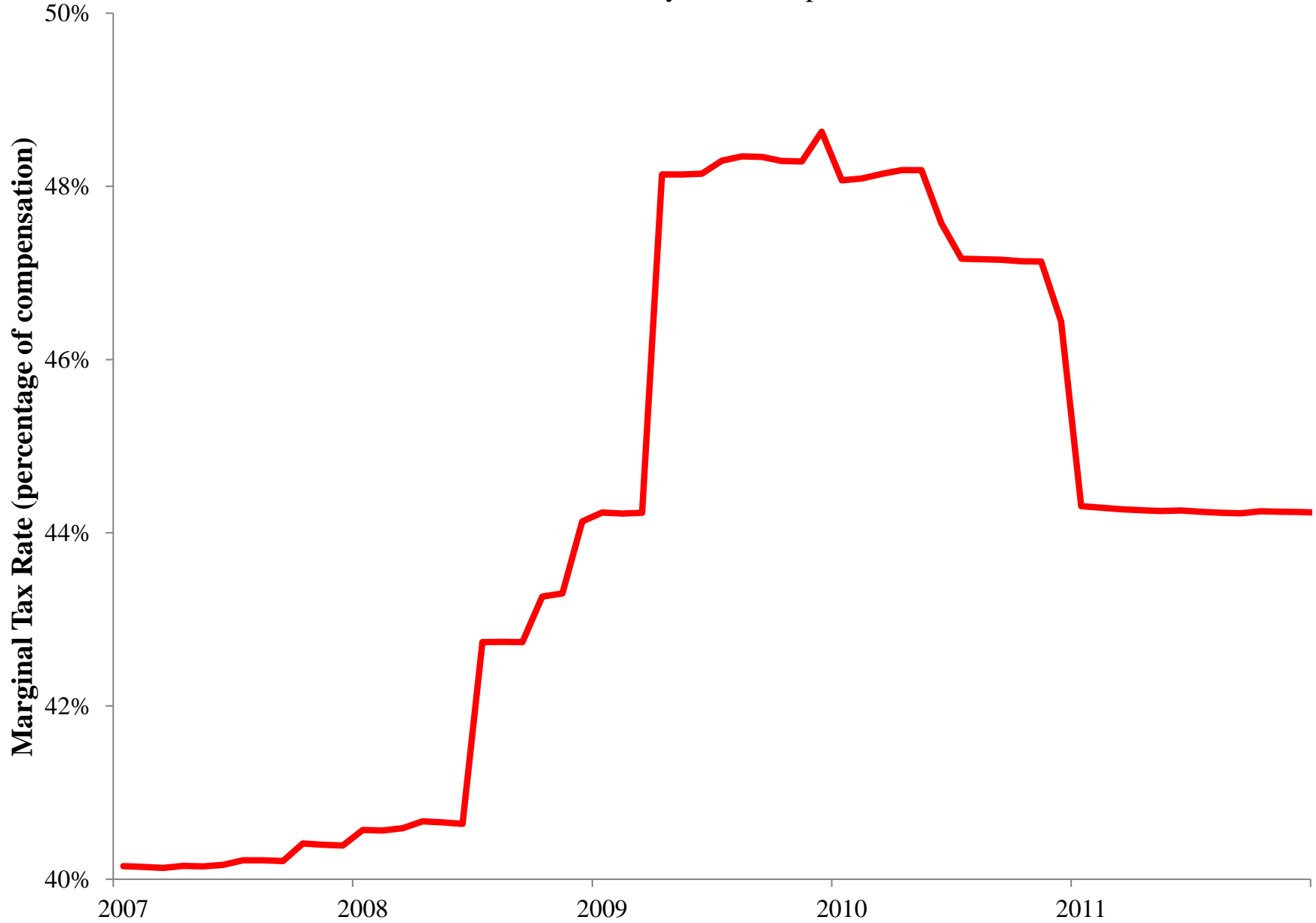
$$\int u\left(\mu\varepsilon + (\mu/\gamma)^\eta - \gamma \frac{\eta}{\eta+1} (\mu/\gamma)^{\eta+1}\right) dG(\varepsilon)$$

- Optimal social insurance is the  $\mu$  that maximizes this
- Optimal degree of social insurance ( $1-\mu$ ) depends on
  - shape of  $u()$  : more risk aversion  $\rightarrow$  more social ins. (move along frontier)
  - shape of  $G$ : more variance  $\rightarrow$  more social ins (frontier twists)
- Changing the composition of information between public and private
  - amounts to changing the distribution of  $G$
  - e.g., aggregate shock makes it harder to disentangle effort from luck

**Figure 2. Changes in the Equity-Efficiency Frontier**



**Figure 4. Statutory Marginal Labor Income Tax Rates**  
for non-elderly heads or spouses



# Optimal Social Insurance: Quantitative

- Holstrom-Milgrom example
  - ARRA (coefficient denoted  $r$ )
  - Normal distribution  $G$
  - No stigma cost
  - Wage elasticity  $\eta = 1$

- Comparative statics for the optimal  $\mu$

$$d \ln \mu = -(1 - \mu)2(d \ln s_\varepsilon) - (1 - \mu)(d \ln r)$$

- Evaluated at  $\mu = 0.44$  and  $d \ln \mu = -0.15$

?

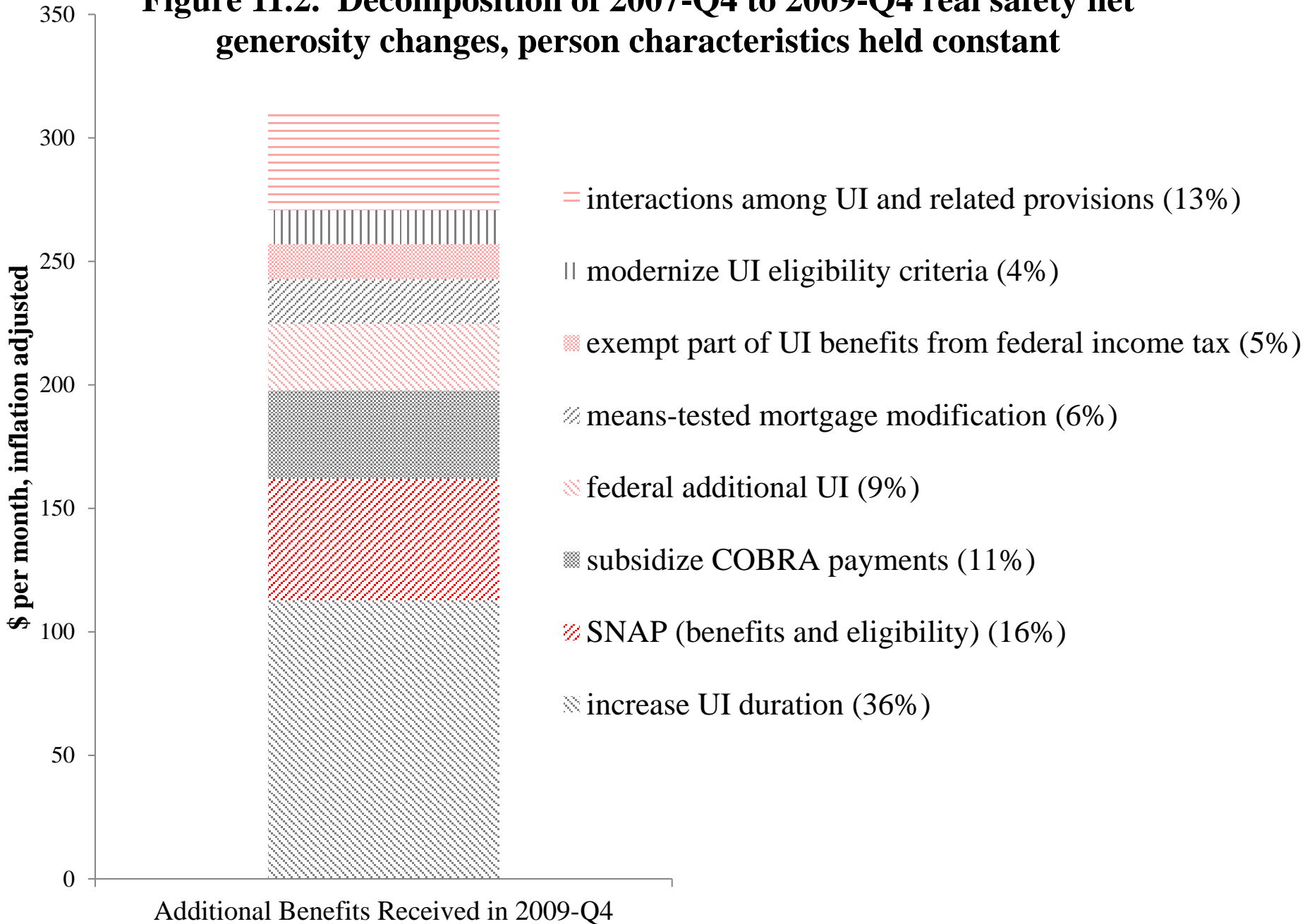
$$-0.15 = -0.88(d \ln s_\varepsilon) - 0.44(d \ln r)$$

- 0.17 added to the log standard deviation would be enough by itself
- 0.34 added to the log ARRA would be enough by itself

**Figure 3. The CBOE Volatility Index, monthly 2006-2010**



**Figure 11.2. Decomposition of 2007-Q4 to 2009-Q4 real safety net generosity changes, person characteristics held constant**



Source: *The Redistribution Recession*, 2012

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  - uncertainty can create an employer wedge if it makes employers less willing to hire at a given wage and productivity. E.g., increase in the optimal markup of price over marginal cost



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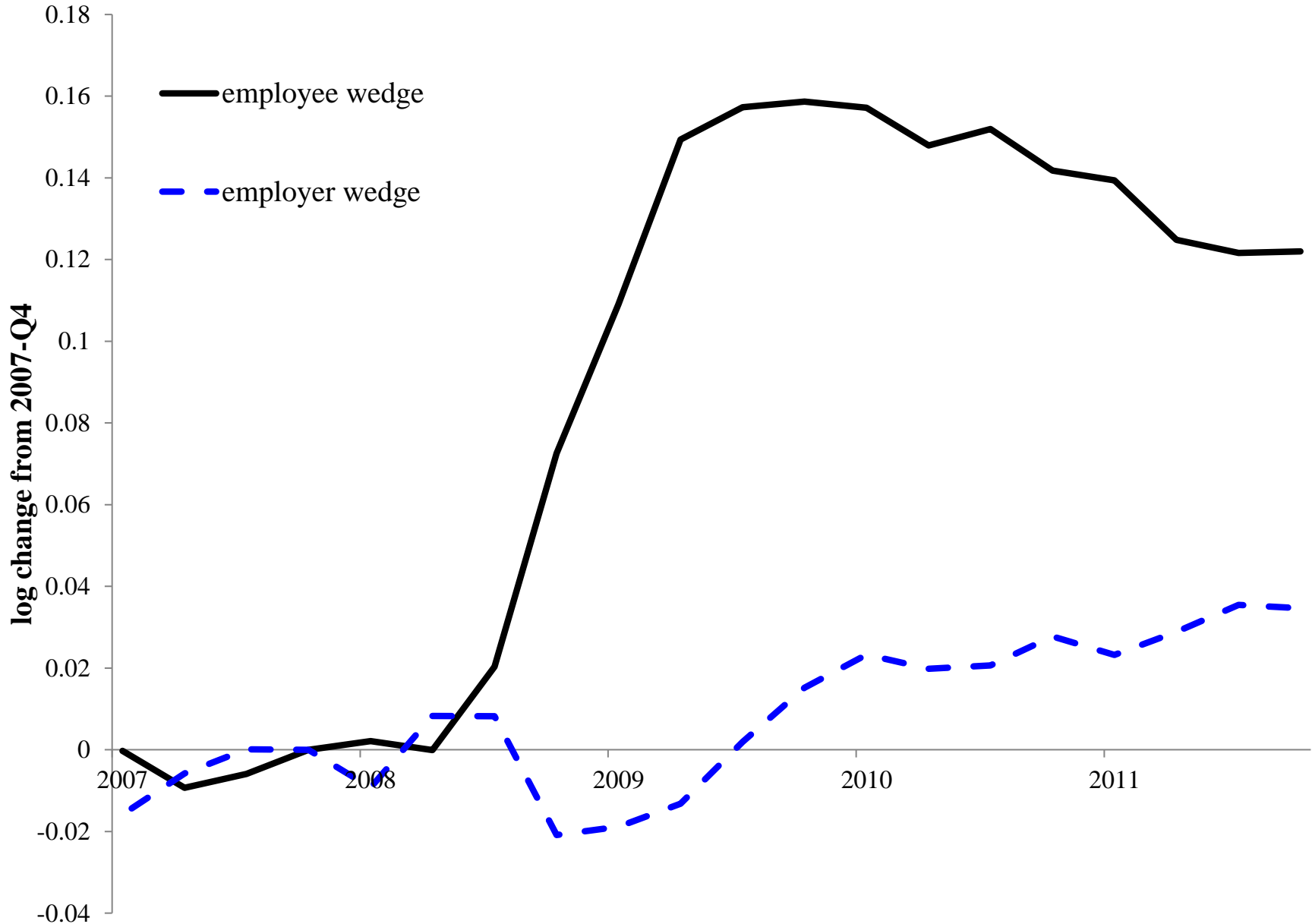
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  - uncertainty can create an employer wedge if it makes employers less willing to hire at a given wage and productivity. E.g., increase in the optimal markup of price over marginal cost
- Employee wedge between market wages and household marginal rate of substitution between consumption and leisure
  - has same tax rate units as employer wedge
  - e.g., payroll tax on employee creates an employee wedge

$$d \ln(\text{labor productivity}) = d \ln(\text{employer wedge}) + d \ln(\text{real wage})$$

$$d \ln(\text{real wage}) = d \ln(\text{employee wedge}) + d \ln MRS$$

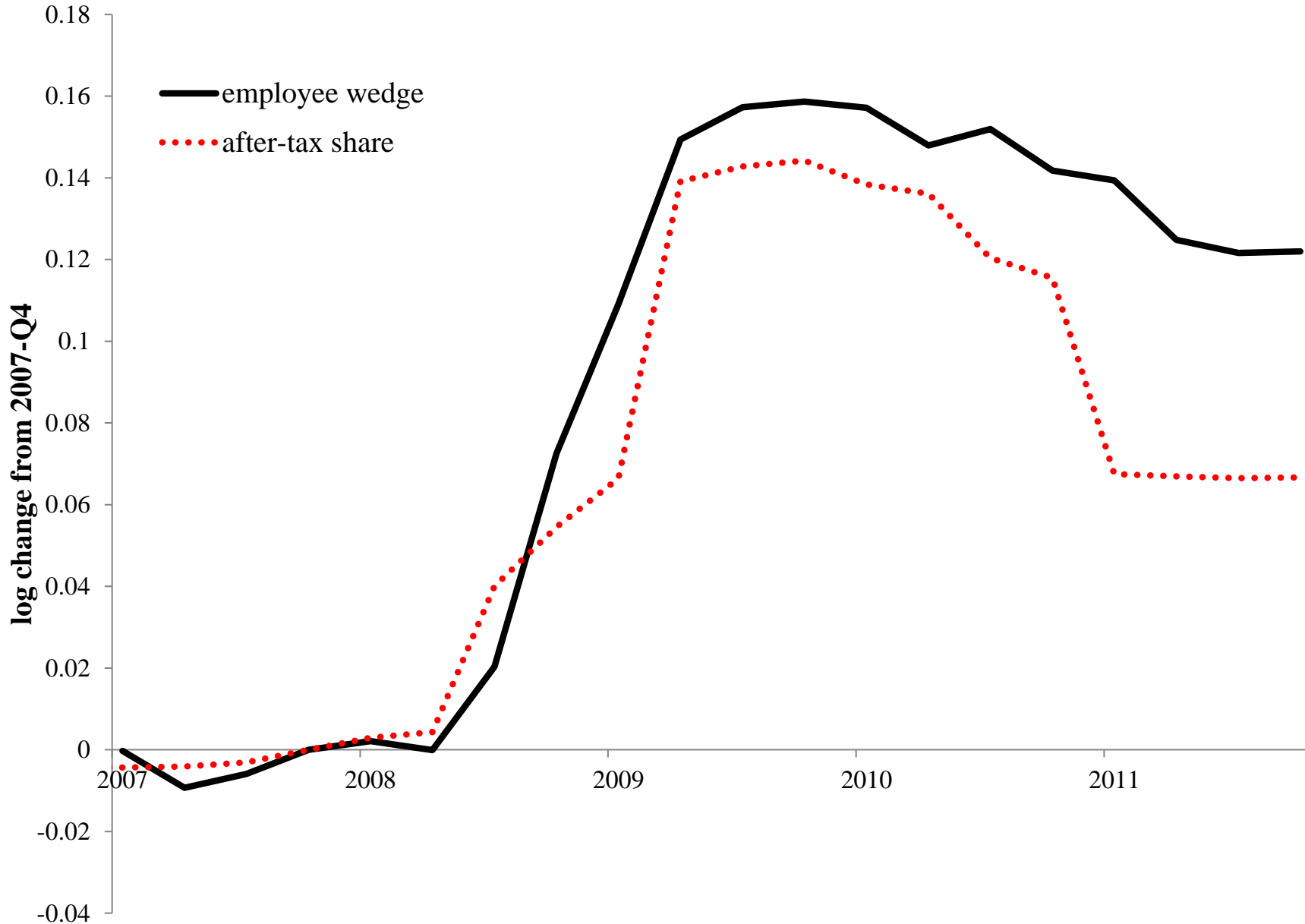
- Both are non-trivial, but employee wedge widens much more

**Figure 5. Labor Market Wedges and Marginal Tax Rates**



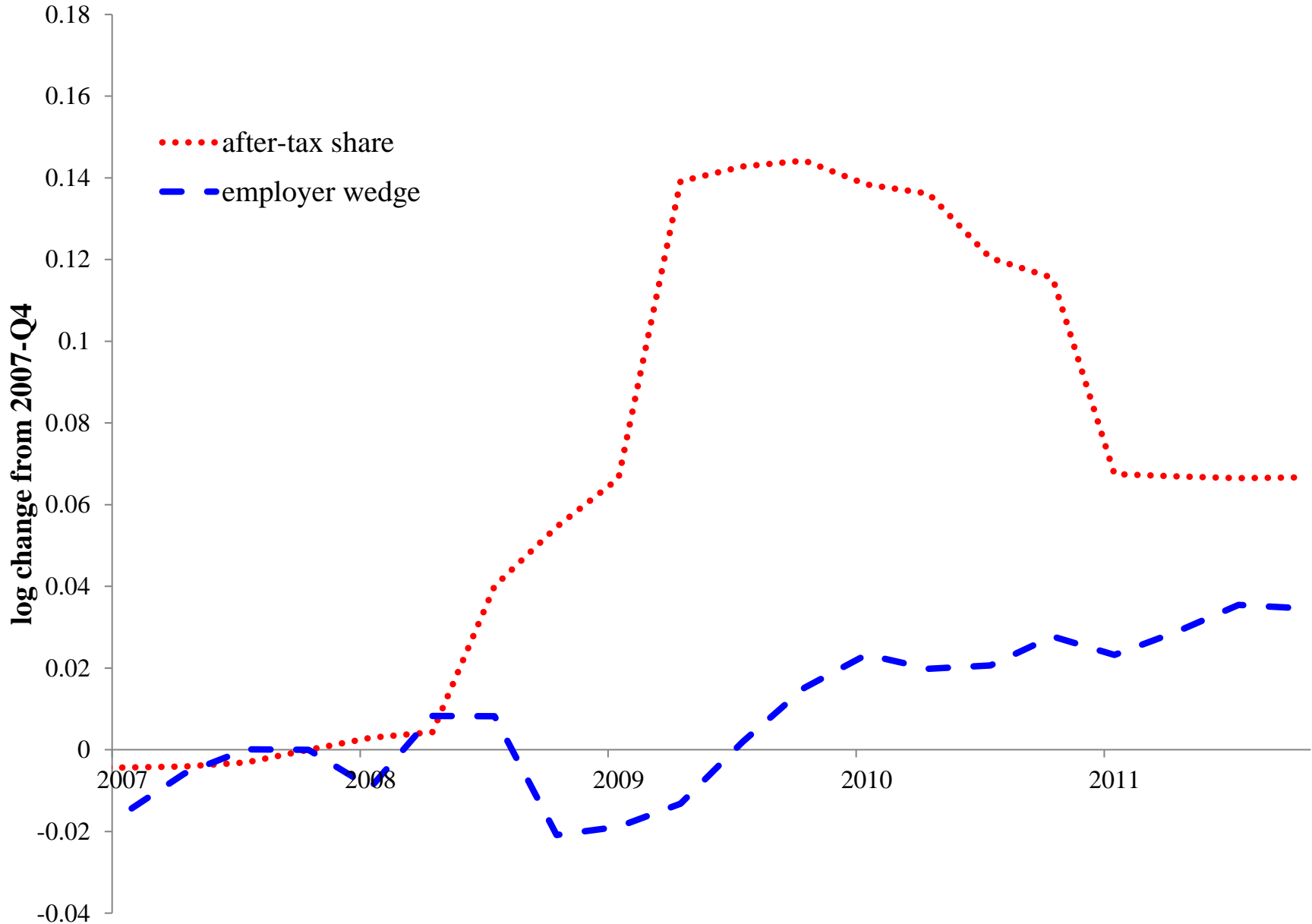
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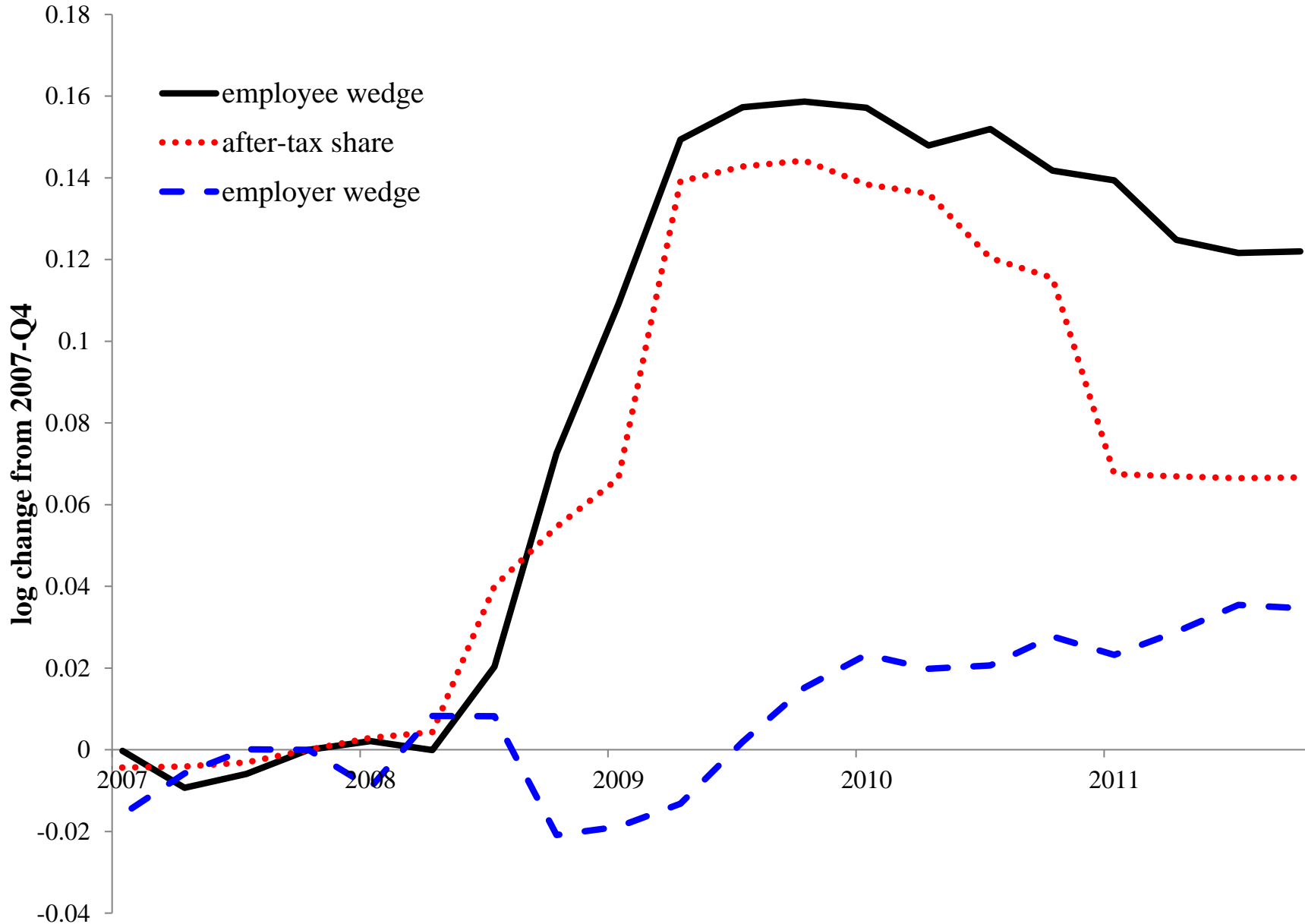
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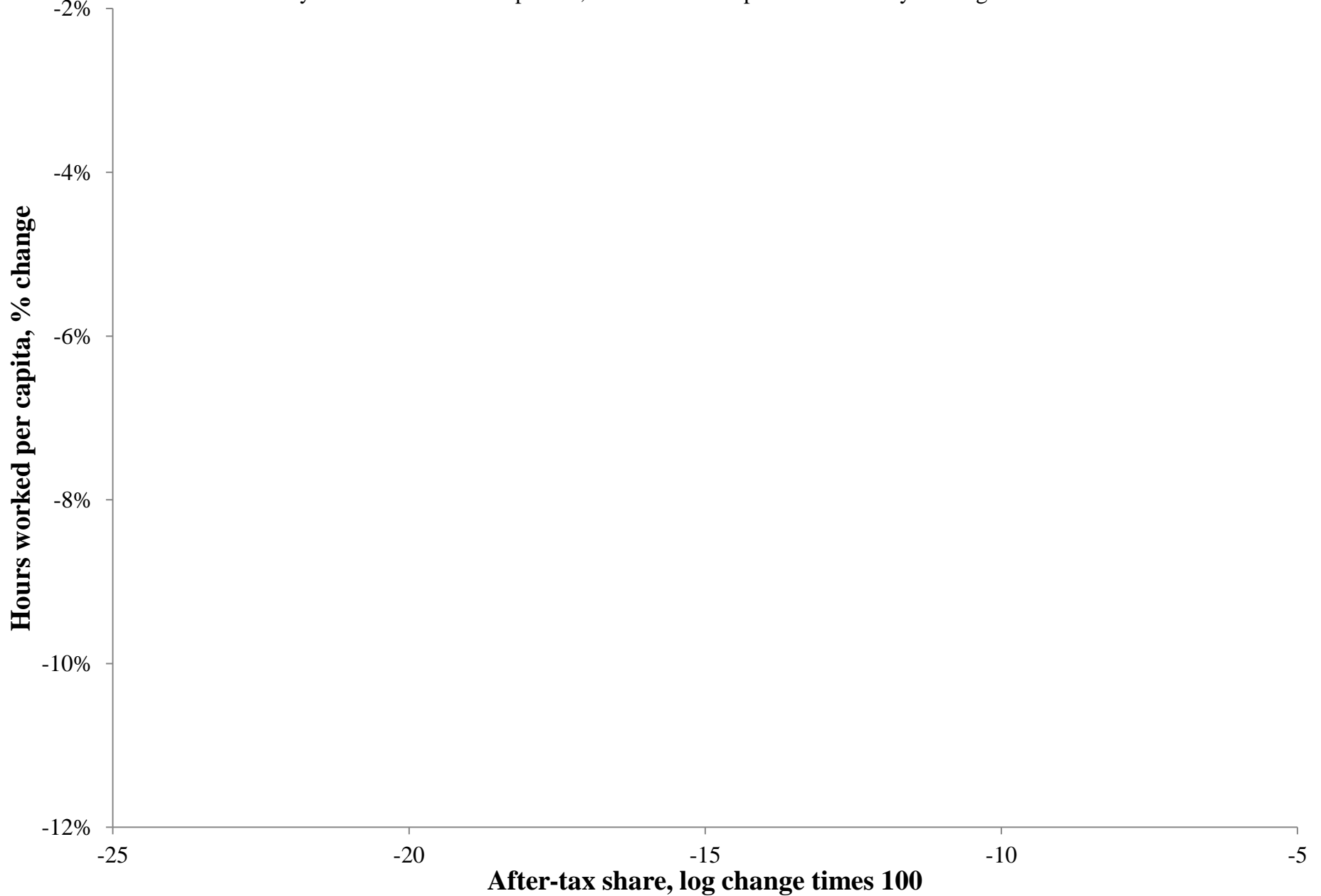
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# Have the Laws of Economics Been Suspended?

- Claim: these days, extra transfers for the poor and unemployed actually *reduce* the number of people eligible for such help
- Empirical study breaking non-elderly adult population into 10 groups
  - 5 skill groups (based on demographics like schooling, age, etc.)
  - Married and unmarried
- Look at program rules to determine marginal tax rates, and their changes 2007-10, for each group
  - forthcoming in *Tax Policy and the Economy*
- Measure 2007-10 changes in hours worked per capita (including zeros for those not working) from CPS data

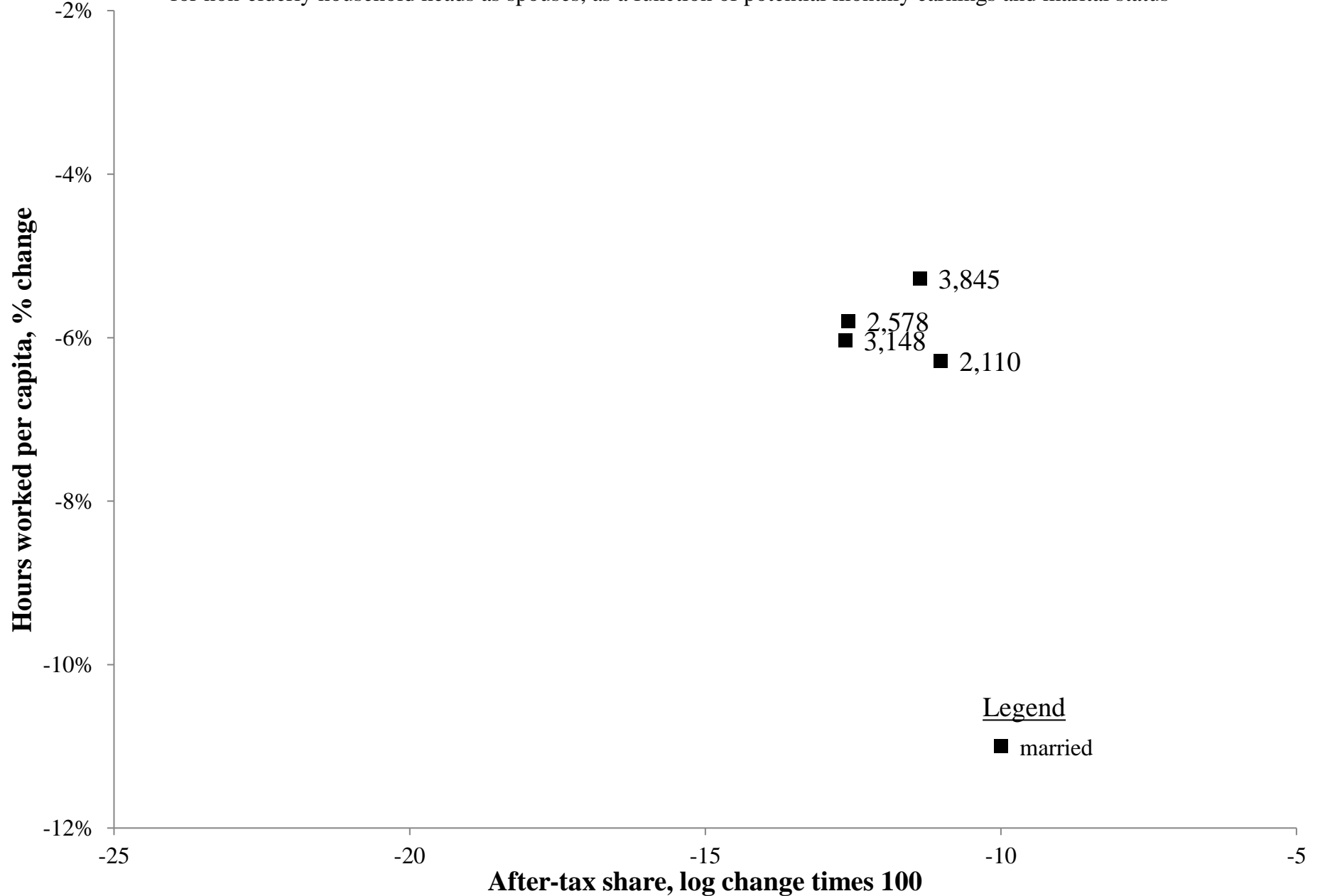
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for non-elderly household heads as spouses, as a function of potential monthly earnings and marital status



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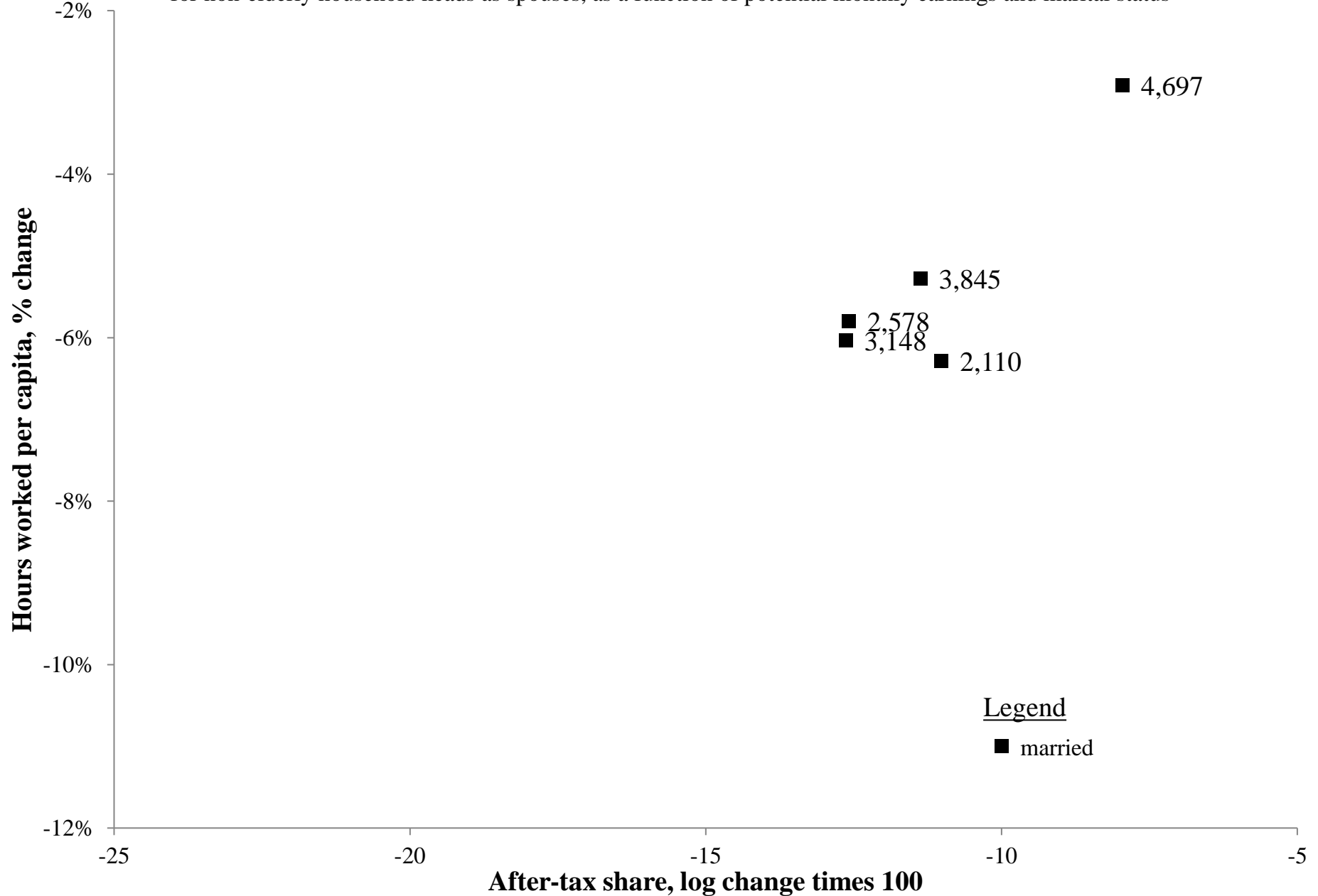
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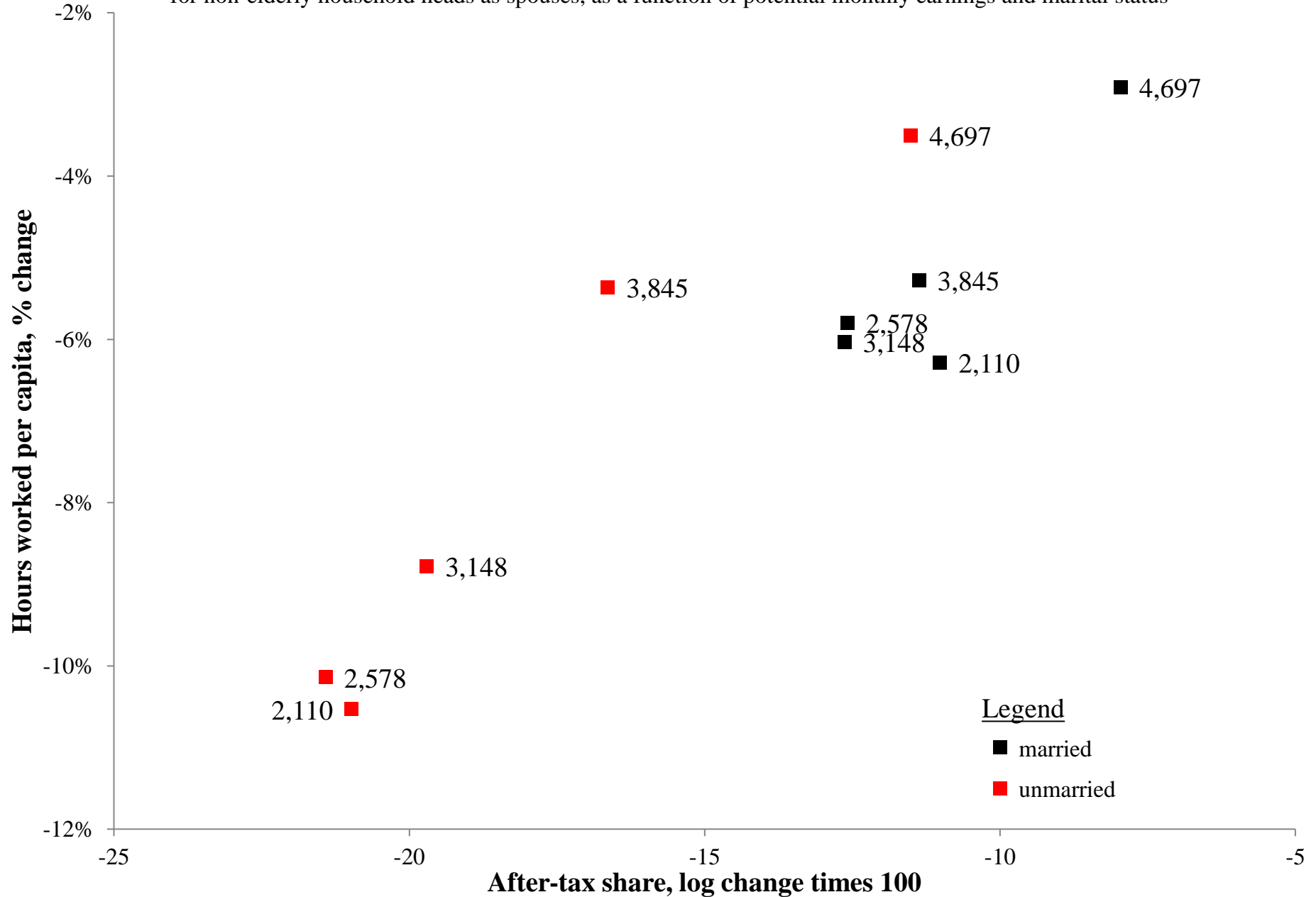
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# Conclusions

- Uncertainty, fear, and risk aversion affect the demand for social insurance
  - the optimal degree of social insurance is sensitive to these variables
  - absent the Keynesian free lunch, more social insurance depresses the labor market
  - social insurance creates a labor wedge, especially on the employee side
  - “The only thing we have to fear is fear itself”
- Uncertainty could affect the quantity of labor (and investment!) more through social insurance than through other mechanisms
- The actual amount of social insurance changed significantly after 2007
  - Largest change in 50+ years
  - Enough to depress the labor at least 5 percent, and investment at least 10 percent