

# Optimal Labor Income Taxation

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# MODERN ECONOMIES DO SIGNIFICANT REDISTRIBUTION

**1) Taxes:** Most OECD countries raise 35%-50% of national income in taxes: tax burden distributed approximately proportional to income

**2) Transfers:** About 2/3 of those revenues fund transfers:

a) Health and Education (approximately universal lumpsum)

b) Retirement (proportional to lifetime income)

c) Income security: unemployment/disability insurance and means-tested transfers

Left/right policy debate focuses on equity/efficiency trade-off

## OPTIMAL INCOME TAXATION: BACKGROUND

**Central Question:** What is the optimal level and profile of taxes and transfers?

- 1) Mirrlees (1971) seminal contribution and subsequent optimal income tax literature was largely **theoretical**
- 2) **Empirical** literature on behavioral responses to taxes and transfers has made enormous progress since 1970s
- 3) Recent research in optimal income taxation has tried to **integrate** better theory and empirical work

## OPTIMAL TAX METHODOLOGY PRINCIPLES

Tax theory can be used for policy if three conditions are met (Diamond-Saez JEP'11):

- 1) Relevance:** Theory based on economic mechanisms empirically relevant and first order
- 2) Robustness:** Theory reasonably robust to changes in modeling assumptions (sufficient statistics)
- 3) Implementation:** Policy prescription is implementable (socially and administratively)

## OUTLINE OF CHAPTER

- 1) Historical and International Background on Taxes/Transfers and Policy Debate
- 2) Social Welfare and Labor Supply Concepts
- 3) Optimal Linear Income Tax
- 4) Optimal Nonlinear Income Tax: (a) Top earners, (b) General profile, (c) Means-tested transfers
- 5) Extensions: (a) tax avoidance/evasion and income shifting, (b) trickle-up/down, (c) commodity taxation, (d) migration, (e) relative income concerns, (f) couples and children
- 6) Limitations: (a) utilitarian normative approach, (b) empirical evidence

## 2. SOCIAL WELFARE APPROACH

Individual  $i$  choose earnings  $z$  to maximize utility taking tax system into account

$$\max_{c,z} u^i(c, z) \quad \text{s.t.} \quad c = z - T(z)$$

$\Rightarrow$  Taxes and transfers distort labor supply choices  $z^i$

Government maximizes a social welfare function s.t. to budget

$$\int_i G(u^i) d\nu(i) \quad \text{s.t.} \quad \int_i T(z^i) d\nu(i) \geq E \quad (p)$$

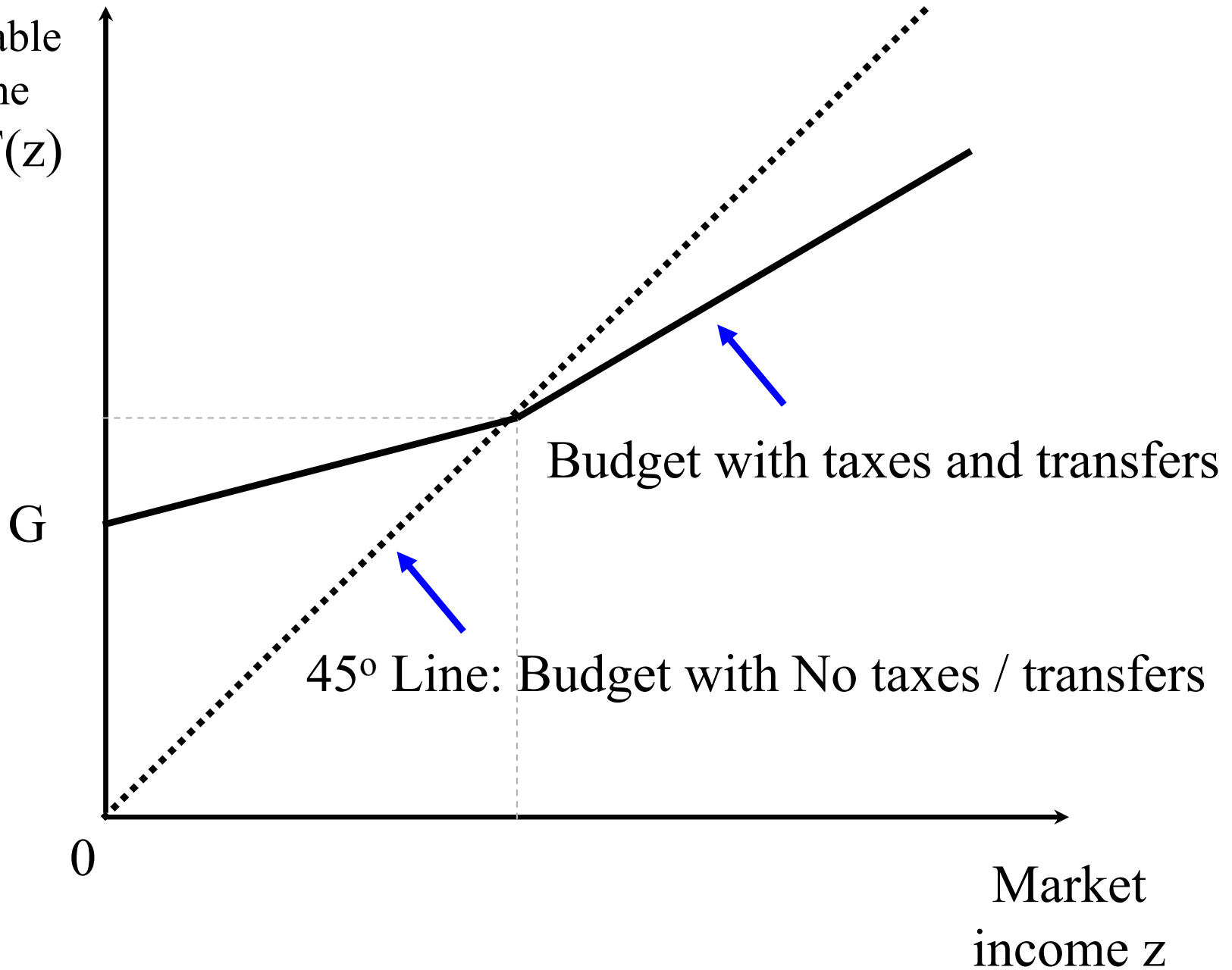
Social marginal welfare weight  $g^i = G'(u^i)u_c^i/p$  measures the social value of giving \$1 to person  $i$  (in terms of public funds)

Absent behavioral responses, the govt wants to redistribute to fully equalize the  $g^i$  across individuals

$T(z)$  includes both transfers ( $T(z) < 0$  at bottom) and taxes ( $T(z) > 0$  at top)

# Effects of Taxes and Transfers

Disposable  
Income  
 $c = z - T(z)$



### 3. OPTIMAL LINEAR TAX

$c = (1 - \tau) \cdot z + R$  with  $\tau$  linear tax rate and  $R$  demogrant funded by taxes  $\tau Z$  with  $Z$  aggregate earnings

Individual labor supply choices  $z^i(1 - \tau, R)$  aggregate to economy wide earnings  $Z(1 - \tau) = \int_i z^i d\nu(i)$

$\tau \rightarrow \tau Z(1 - \tau)$  is the “Laffer Curve” with top  $\tau^* = 1/(1 + e)$  where  $e$  is the aggregate elasticity of  $Z$  wrt  $1 - \tau$

Optimal linear tax rate is:

$$\tau = \frac{1 - \bar{g}}{1 - \bar{g} + e} \quad \text{with} \quad \bar{g} = \frac{\int g^i z^i d\nu(i)}{\int g^i d\nu(i) \cdot \int z^i d\nu(i)} < 1$$

captures the equity-efficiency trade-off **robustly** ( $\tau \downarrow \bar{g}$ ,  $\tau \downarrow e$ )



## 4. NON-LINEAR TAX: TOP EARNERS

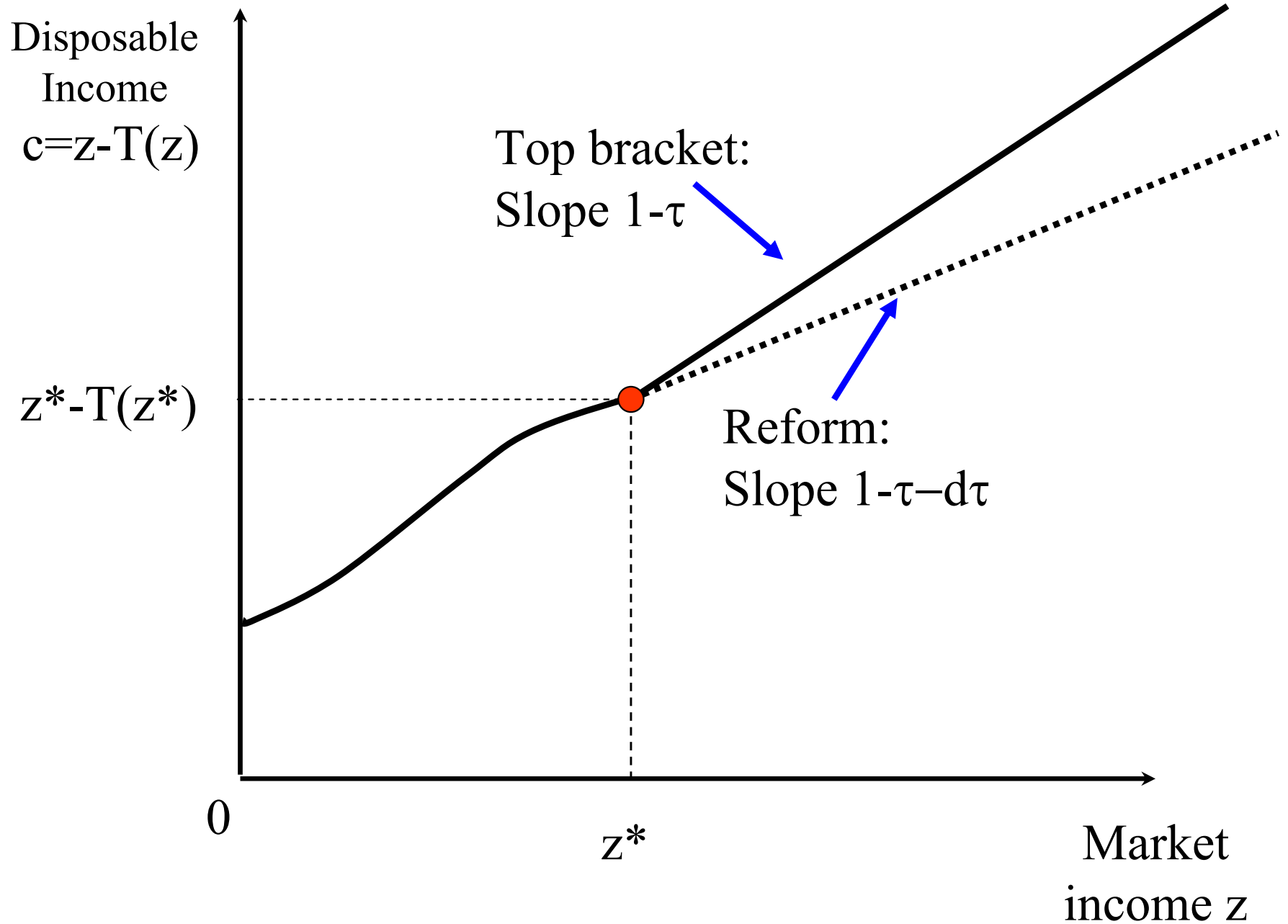
**Pre-tax** top US incomes have surged in recent decades: top 1% income share increased from 9% in 1970 to 23.5% in 2007 (Piketty-Saez, 2003)

⇒ US Top 1% has huge potential fiscal capacity:

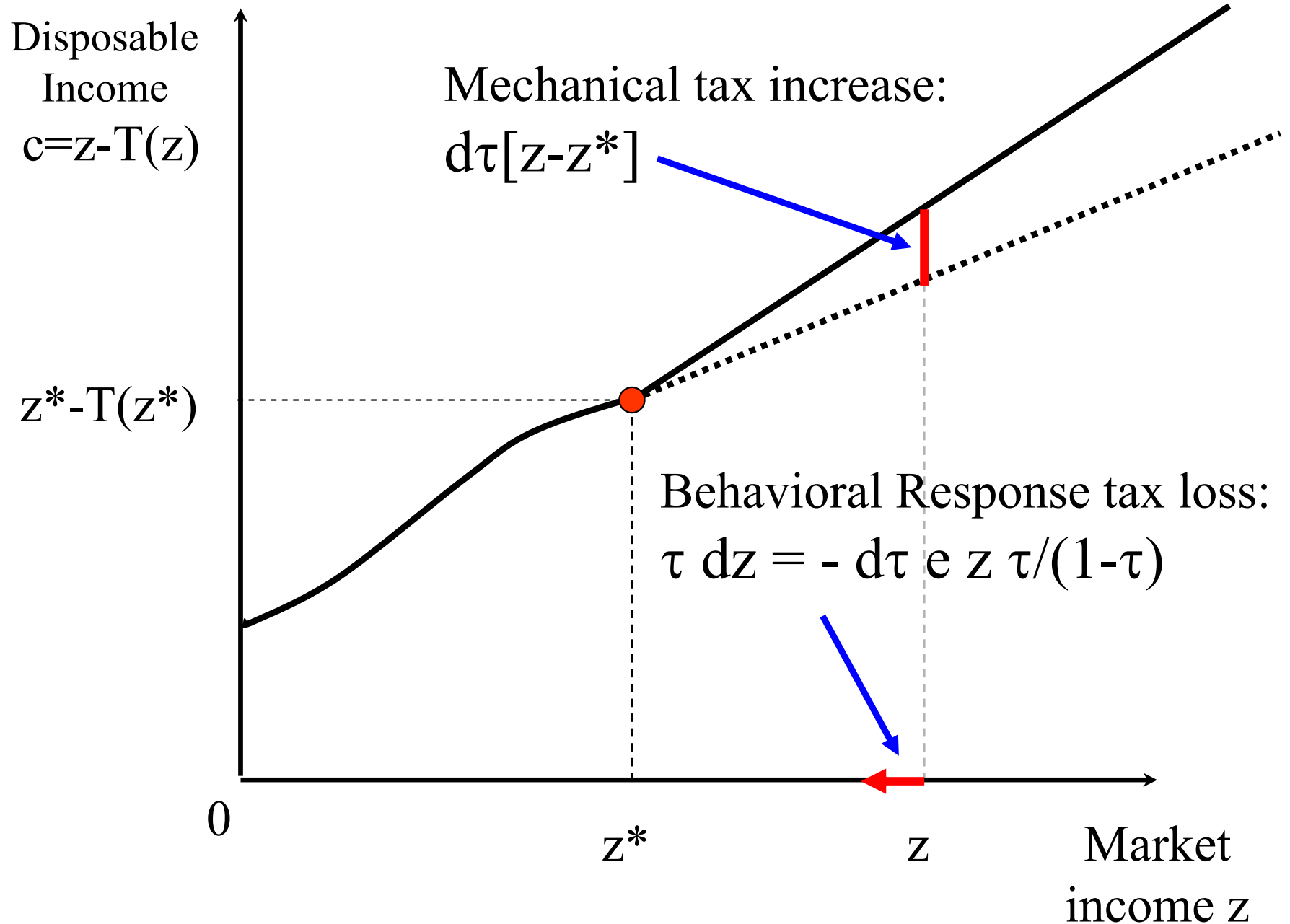
Absent behavioral responses, increasing Federal individual average tax rate on top 1% from current 22% to 43% would raise revenue by 3 pts of GDP [\$450bn/year]

Suppose top marginal tax rate is  $\tau$  and applies above  $z^*$  (in US,  $\tau = 42.5\%$  including all taxes and  $z^* = \$400K \simeq$  top 1% threshold)

# Optimal Top Income Tax Rate (Mirrlees '71 model)



# Optimal Top Income Tax Rate (Mirrlees '71 model)



## 4. OPTIMAL TOP INCOME TAX RATE

Revenue maximizing top **marginal tax rate** (above  $z^*$ ):

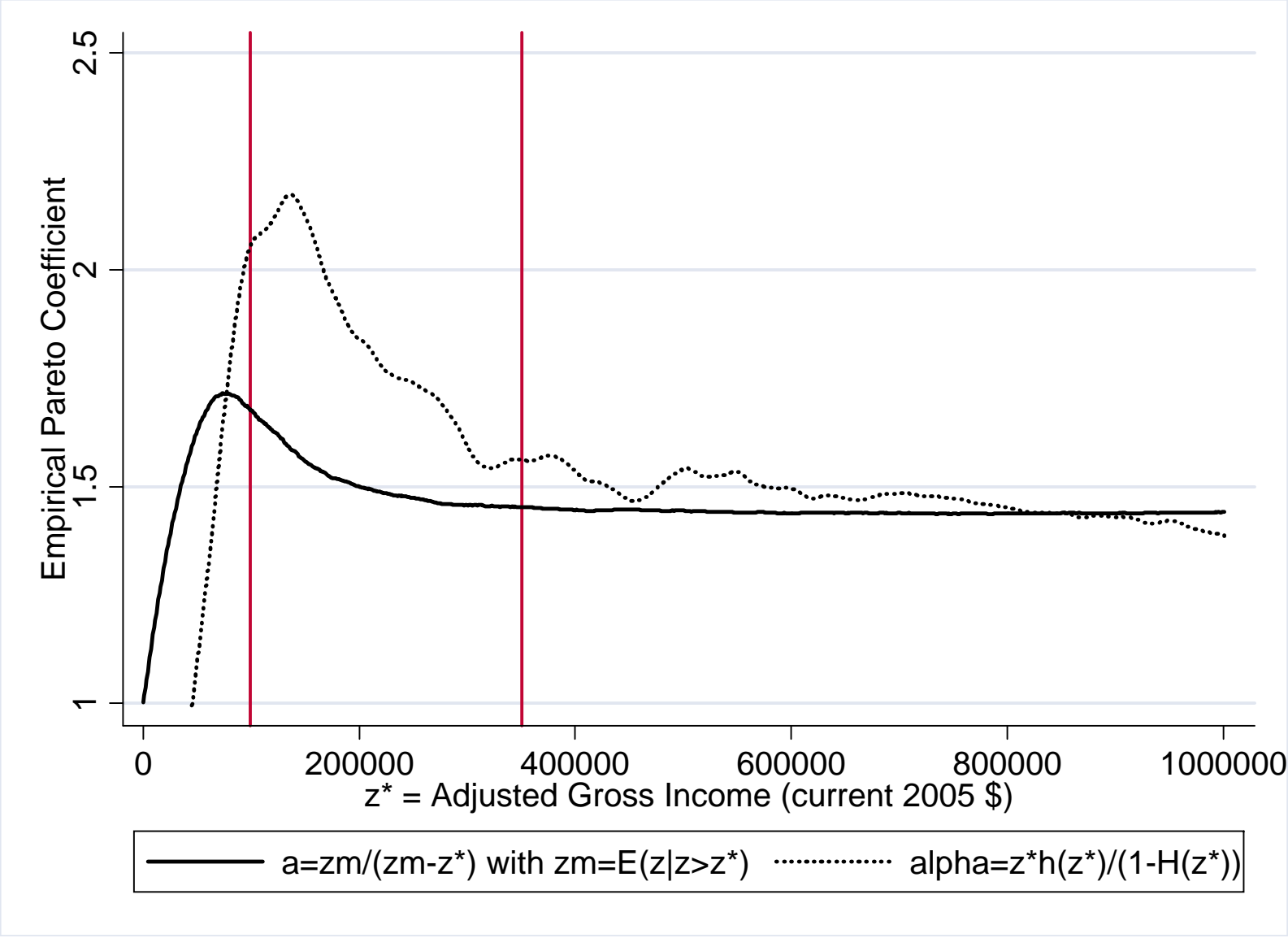
$$\tau^* = \frac{1}{1 + a \cdot e}$$

where  $e$  is the **elasticity** of top incomes with respect to  $1 - \tau$

and  $a = z_m / (z_m - z^*)$  is **Pareto** parameter with  $z_m =$  average income above  $z^*$

$a$  very stable with  $z^*$  (around 1.5 today in the US)

If social weights  $g^i$  converge to zero when  $z \rightarrow \infty \Rightarrow$  optimal asymptotic tax rate is  $\tau^* = 1 / (1 + a \cdot e)$



## 4. ZERO TOP RATE RELEVANCE

Actual income distribution is finite and  $z_m = z^*$  at the top so that  $a = z_m / (z_m - z^*) = \infty$  and  $\tau^* = 0$  at the top. However:

1) Result applies only to highest earner (and not second highest)

2) Govt does not know top ex-ante: top income tail is a like a finite draw from a Pareto distribution

If govt maximizes expected social welfare using an expected revenue budget constraint then  $\tau^* = 1 / (1 + a \cdot e)$  remains the optimal tax rate (Diamond-Saez JEP'11)

## 4. REAL VS. AVOIDANCE RESPONSES: THEORY

Fraction  $s$  of response  $dz$  to  $d\tau$  due to avoidance (fraction  $1 - s$  is real) and “shifted income”  $s \cdot dz$  is taxed at rate  $t \leq \tau$

⇒ Tax revenue maximizing rate is (Saez, Slemrod, Giertz '11)

$$\tau = \frac{1 + a \cdot t \cdot s \cdot e}{1 + a \cdot e}$$

1) If  $t = 0$  then  $\tau = 1/(1 + a \cdot e)$  (avoidance vs. real irrelevant)

2) If  $t > 0$  then  $\tau > 1/(1 + a \cdot e)$  because of “fiscal externality”

3) **Fully optimal policy:**  $t = \tau$  and  $\tau = 1/[1 + a \cdot (1 - s)e]$  with  $(1 - s)e$  real elasticity (avoidance response  $s \cdot e$  irrelevant)

⇒ (a) broaden the base and close loopholes, (b) then increase top rates

## 4. RENT-SEEKING RESPONSES: THEORY

In models with frictions or imperfect information, pay  $z$  does not always equal marginal product  $y \Rightarrow$  scope for rent-seeking bargaining  $\Rightarrow$  Classical Externality

Suppose fraction  $s$  of the response  $dz$  to  $d\tau$  is due to bargaining (and fraction  $1 - s$  is real so that  $dy = (1 - s)dz$ )

Tax revenue maximizing rate (Piketty, Saez, Stantcheva '11):

$$\tau = \frac{1 + a \cdot s \cdot e}{1 + a \cdot e}$$

**1) Trickle-up:** If top earners overpaid  $y < z$ , then  $s > 0$  and  $\tau > 1/(1 + a \cdot e)$

**2) Trickle-down:** If top earners underpaid, then  $s < 0$  is possible and  $\tau < 1/(1 + a \cdot e)$



## 4. WHAT IS THE ELASTICITY FOR TOP EARNERS?

Large empirical literature estimating  $e$  using tax reforms and micro tax return data and aggregate share data

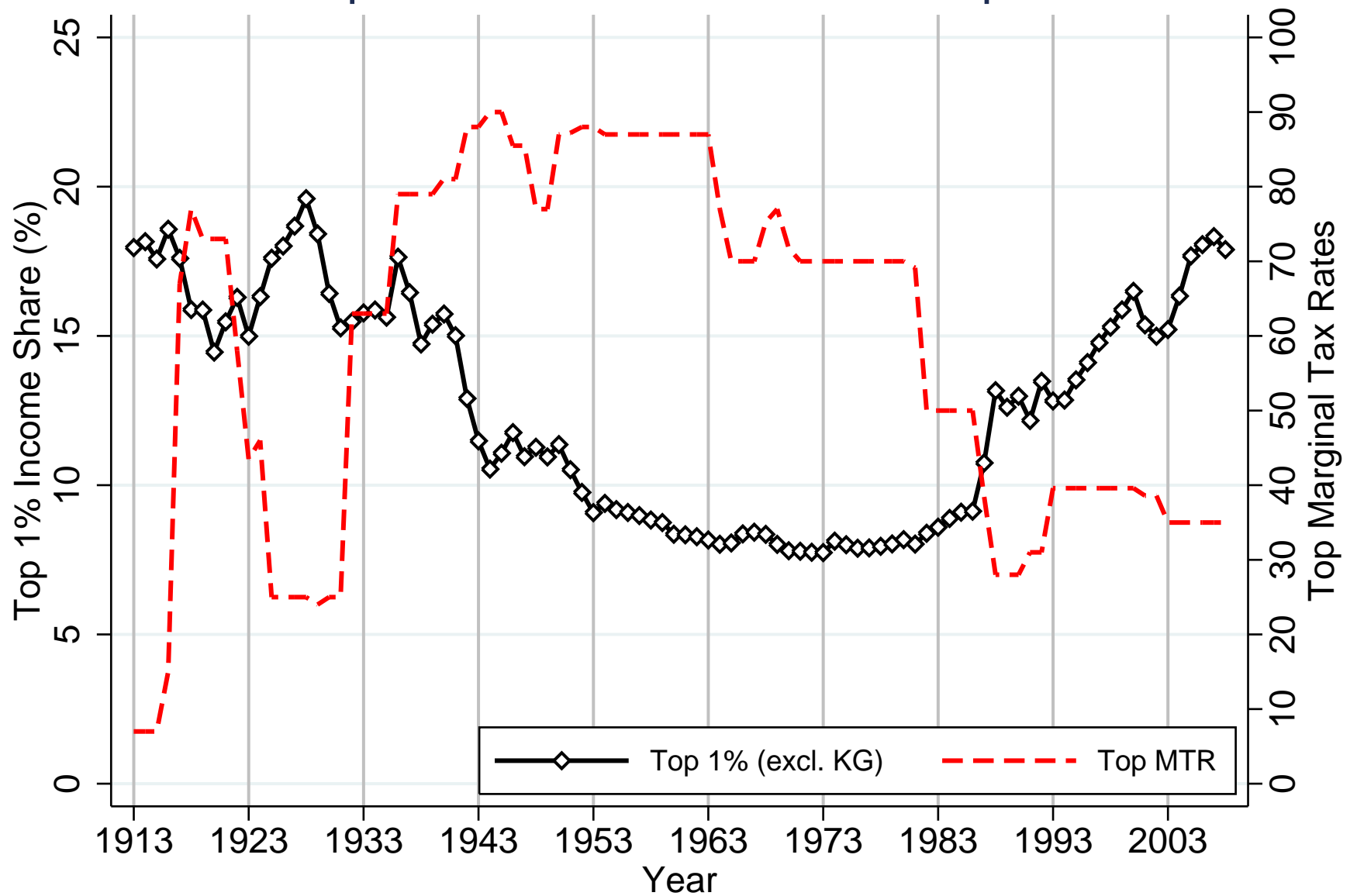
**1) Long-run:** Clear correlation between top income shares and net-of-tax top rates in the long-run (within country and across countries)

**2) Short-run:** Heterogeneity in size of behavioral responses in the short-run

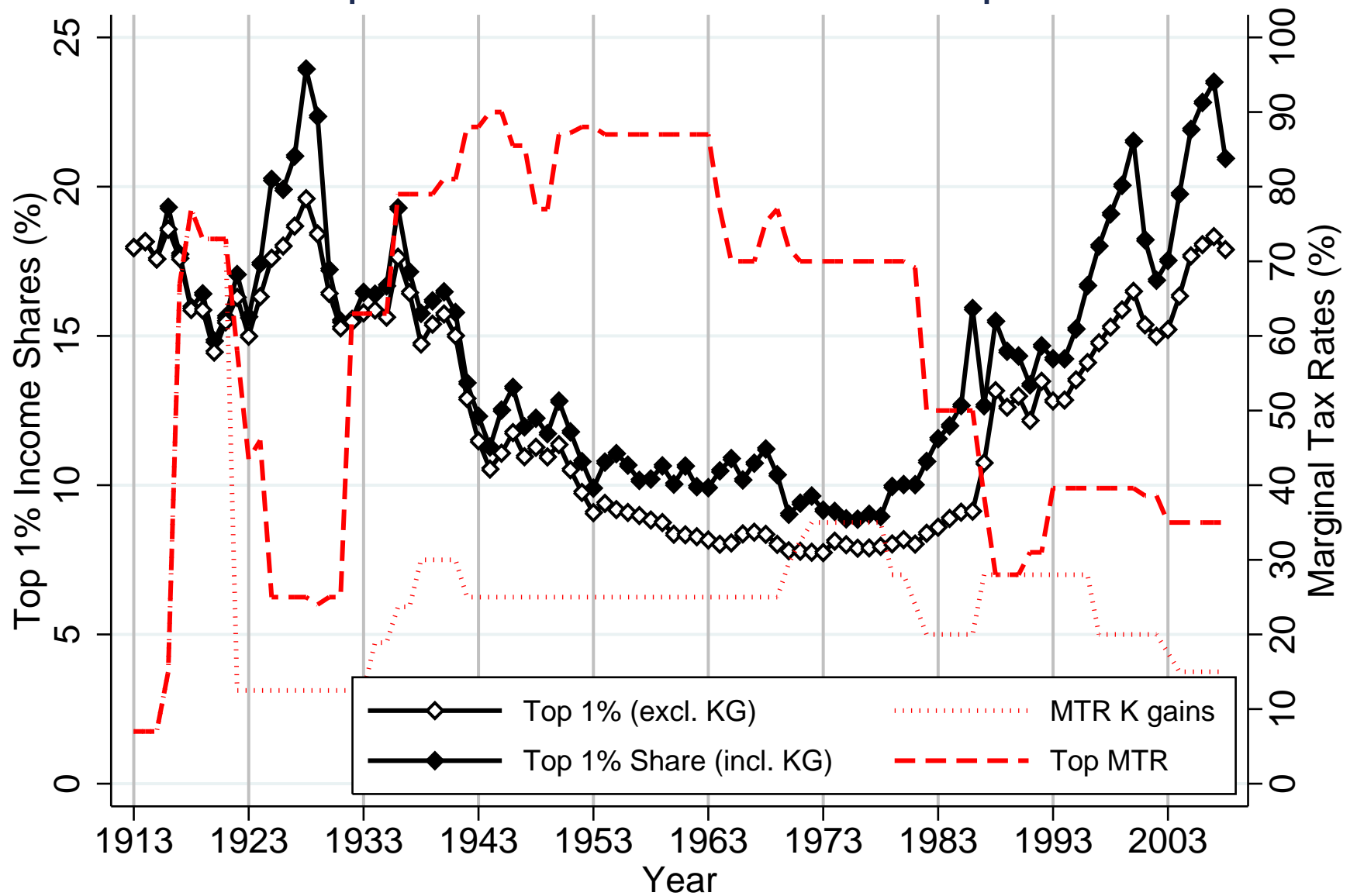
a) Large responses always due to **tax avoidance** (income shifting, income re-timing)

b) No compelling evidence of large **real** responses in the short-run

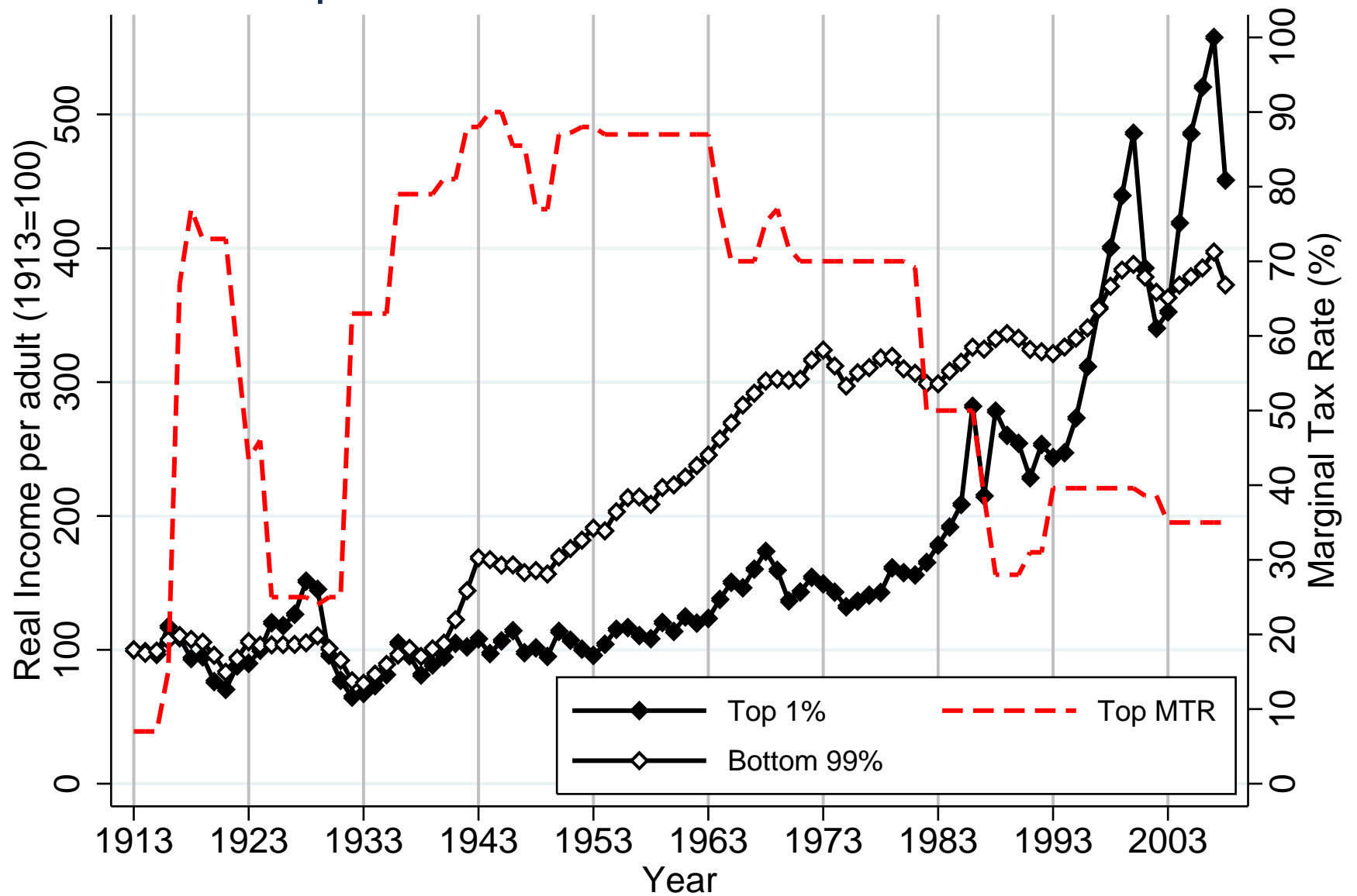
# A. Top 1% Income Shares and Top MTR



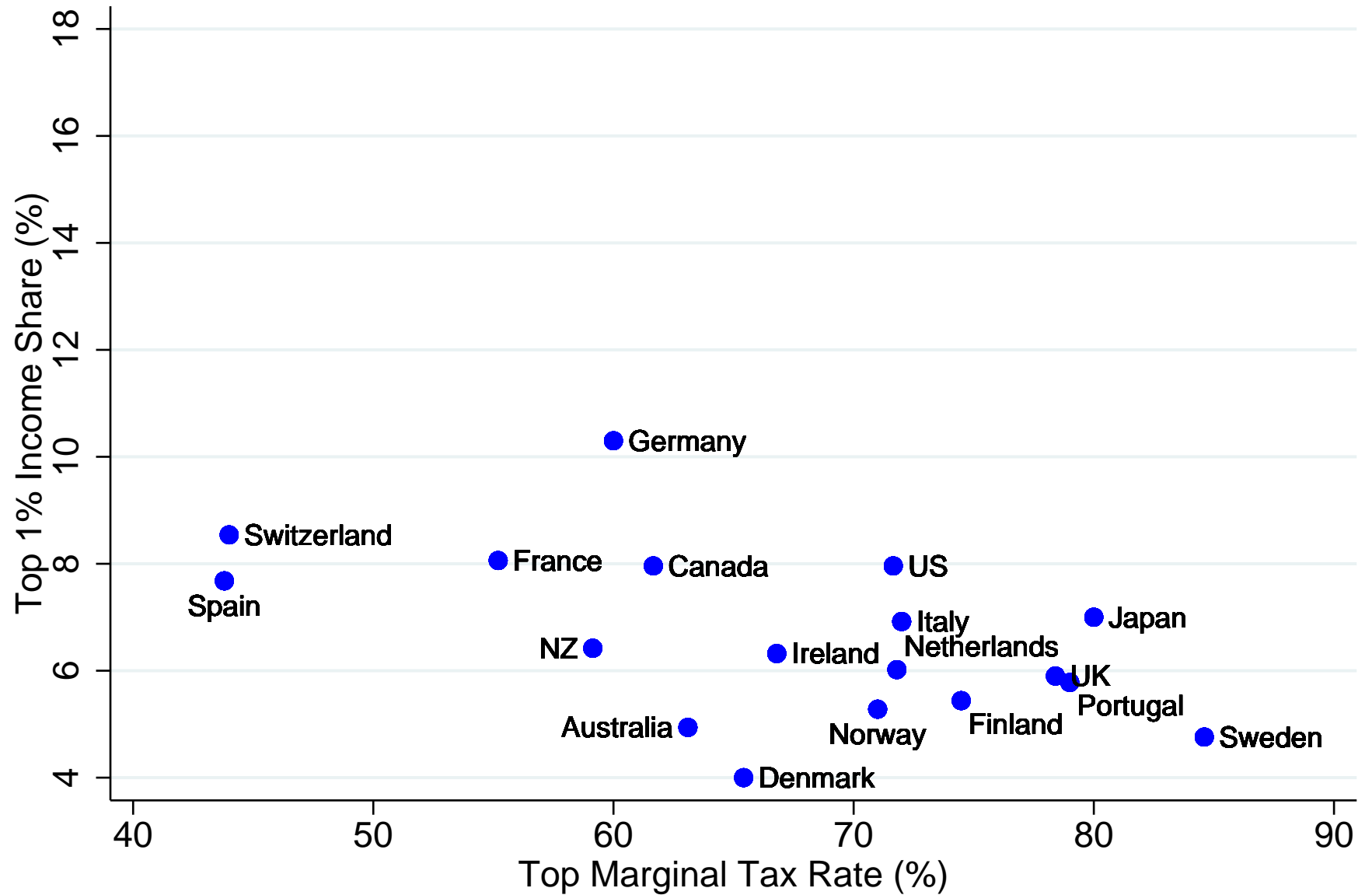
## B. Top 1% Income Shares and Top MTR



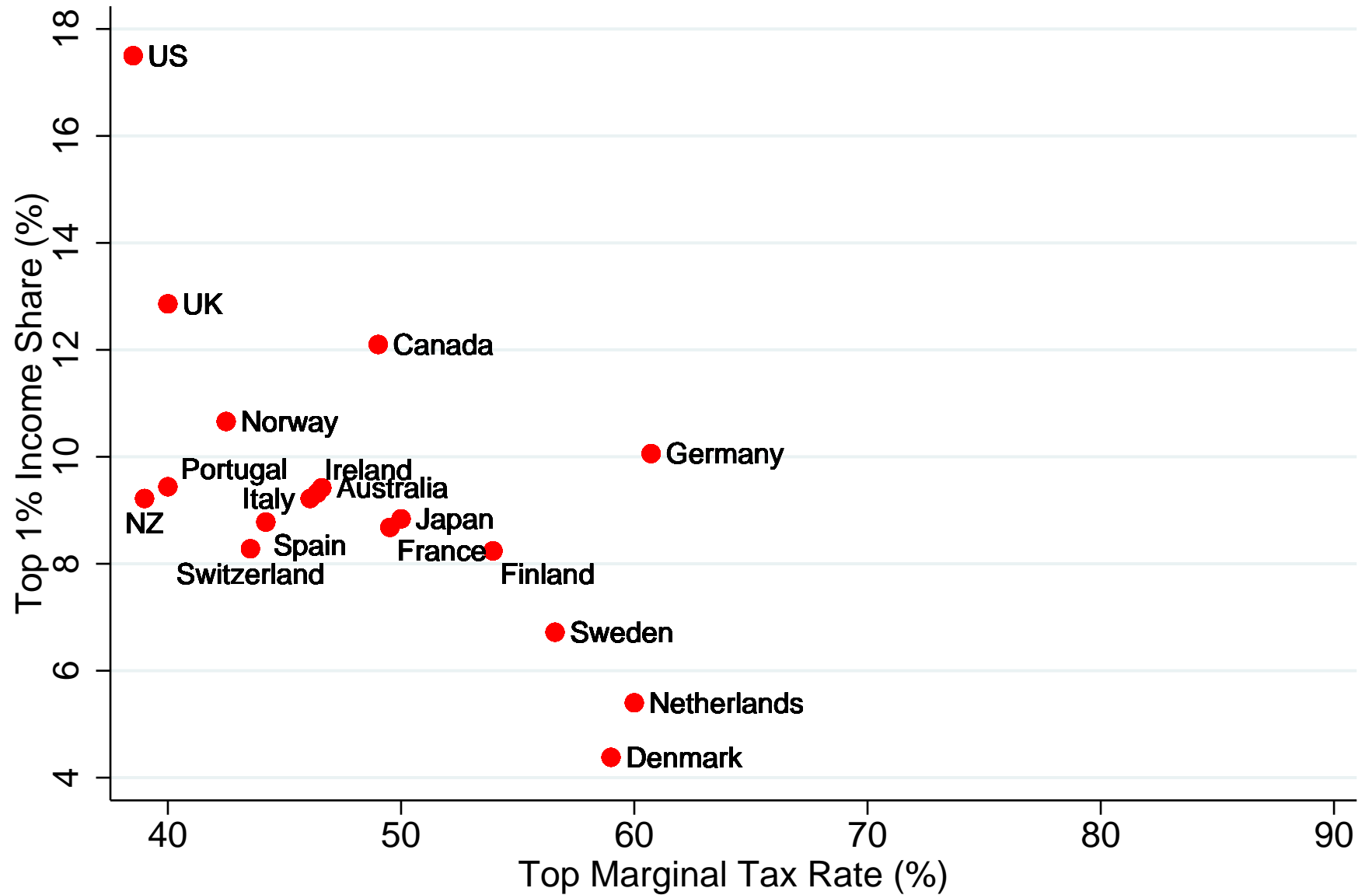
### C. Top 1% and Bottom 99% Income Growth



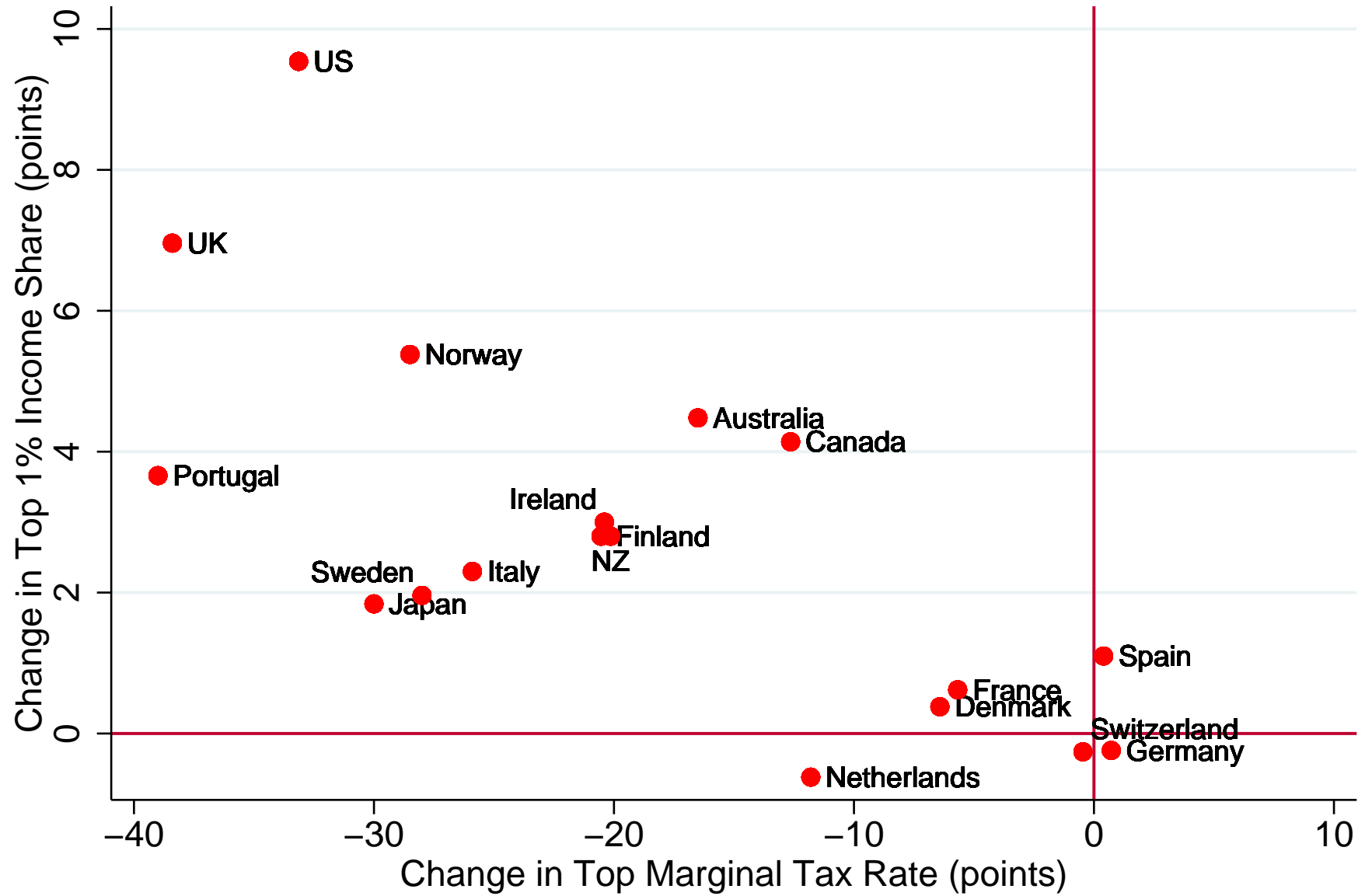
# A. Top 1% Share and Top Marginal Tax Rate in 1975–9



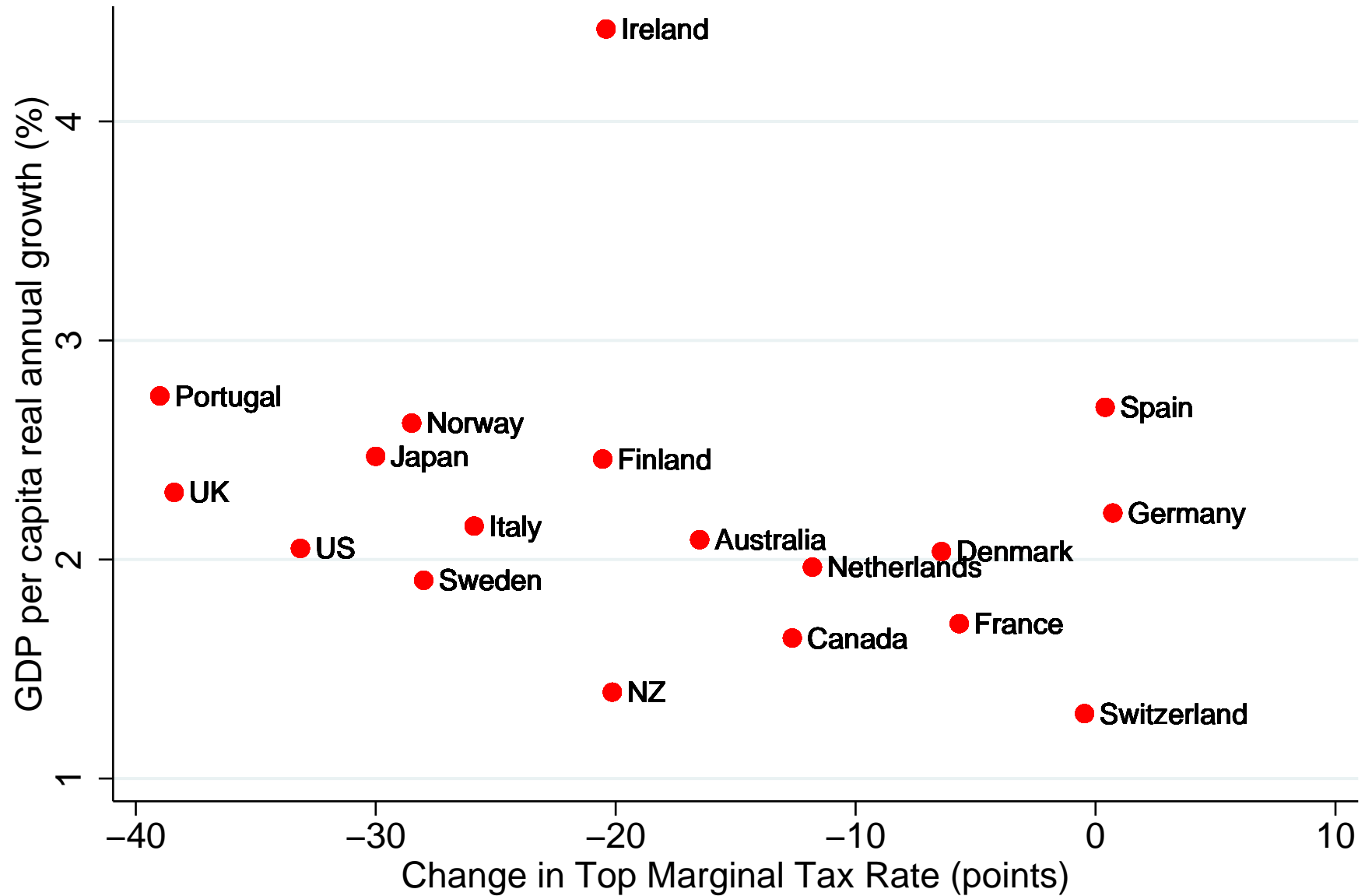
## B. Top 1% Share and Top Marginal Tax Rate in 2004–8



# A. Changes Top 1% Share and Top Marginal Tax Rate



## B. Growth and Change in Top Marginal Tax Rate





## 4. ANATOMY OF BEHAVIORAL RESPONSES

**1) Avoidance:** Is the surge in US top income shares explained by reduced tax avoidance/evasion since 1970s instead of change in real income?

**Test:** Under avoidance scenario, narrower measures of taxable income should be much more responsive to marginal tax rates than broader measures including tax preferred income items

First pass is to compare income excluding and including tax preferred realized capital gains  $\Rightarrow$  Does not support tax avoidance scenario

**2) Rent-Seeking:** Has top 1% income share surge come at the expense of the 99%?

**Test:** First pass is to look at correlation between economic growth and top tax rate cuts  $\Rightarrow$  No correlation supports trickle-up (more work needed)

## 4. INTERNATIONAL MIGRATION

Public debate concern that top skilled individuals move to low tax countries (e.g., in EU context) or low tax states (within US Federation)

Optimal top tax rate with migration elasticity  $e_M$  + intensive elasticity  $e$  is:

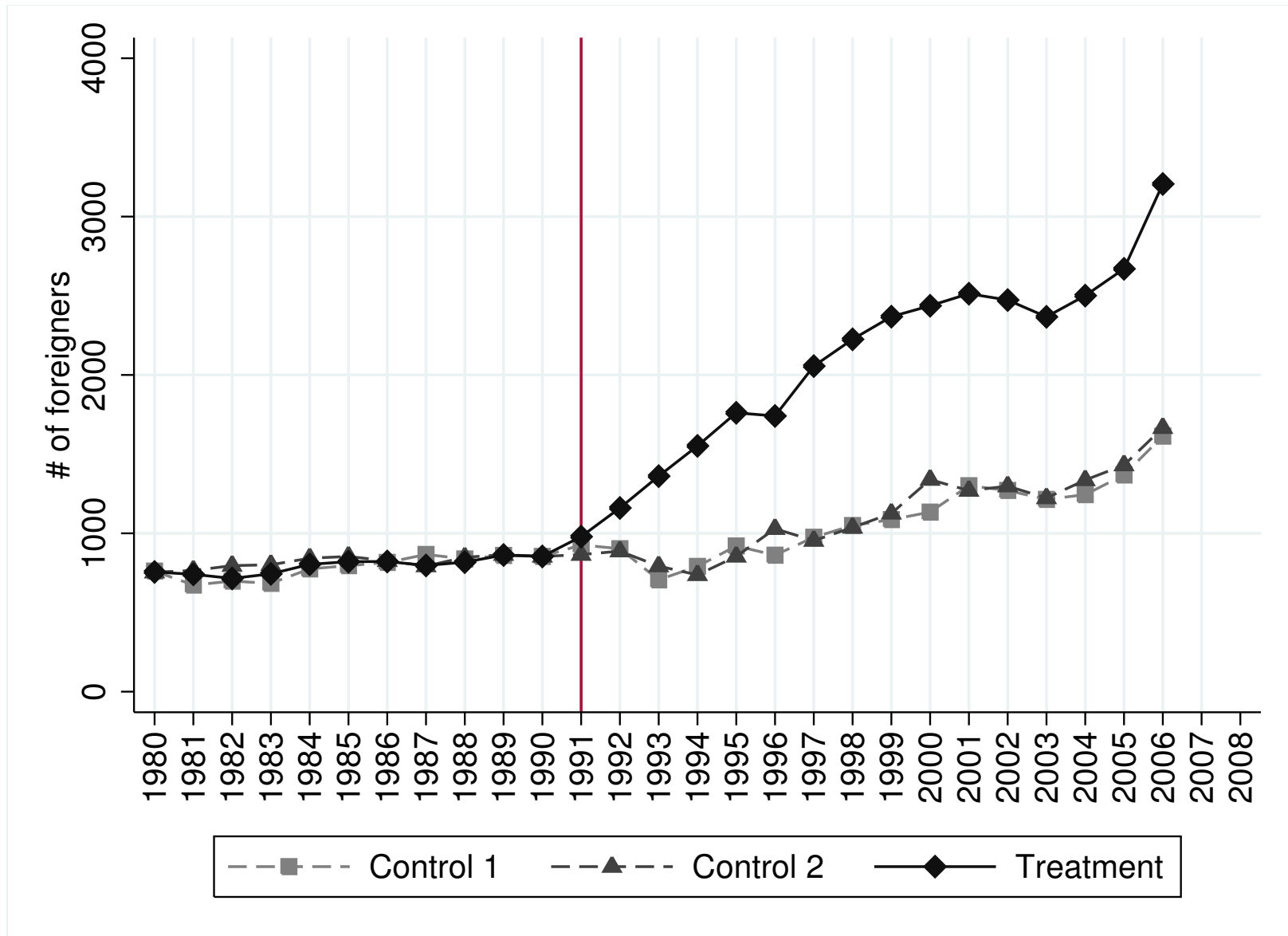
$$\tau = \frac{1}{1 + a \cdot e + e_M}$$

Much less empirical work on  $e_M$  (than on  $e$ )

Some EU countries have adopted special low flat tax schemes for highly paid foreigners: Kleven et al. (2011) find enormous response with  $e_M \geq 1$  in the case of Danish scheme

At global level  $e_M = 0 \Rightarrow$  International cooperation increases taxing power

Figure 3: Total number of foreigners in different income groups



Control 1= annualized income between .8 and .9 of threshold  
Control 2= annualized income between .9 and .995 of threshold.

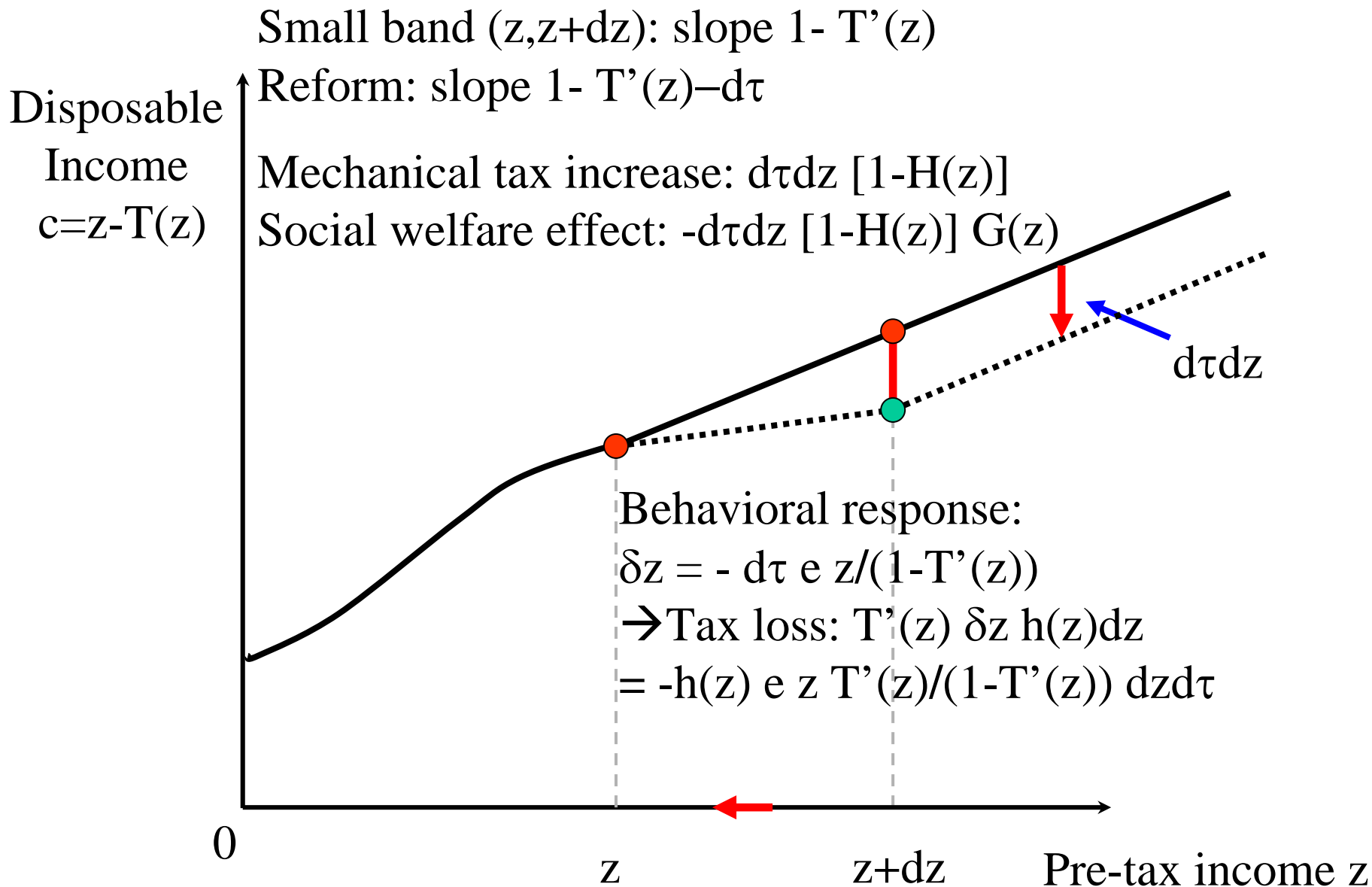
## 4. GENERAL NONLINEAR OPTIMAL $T'(z)$

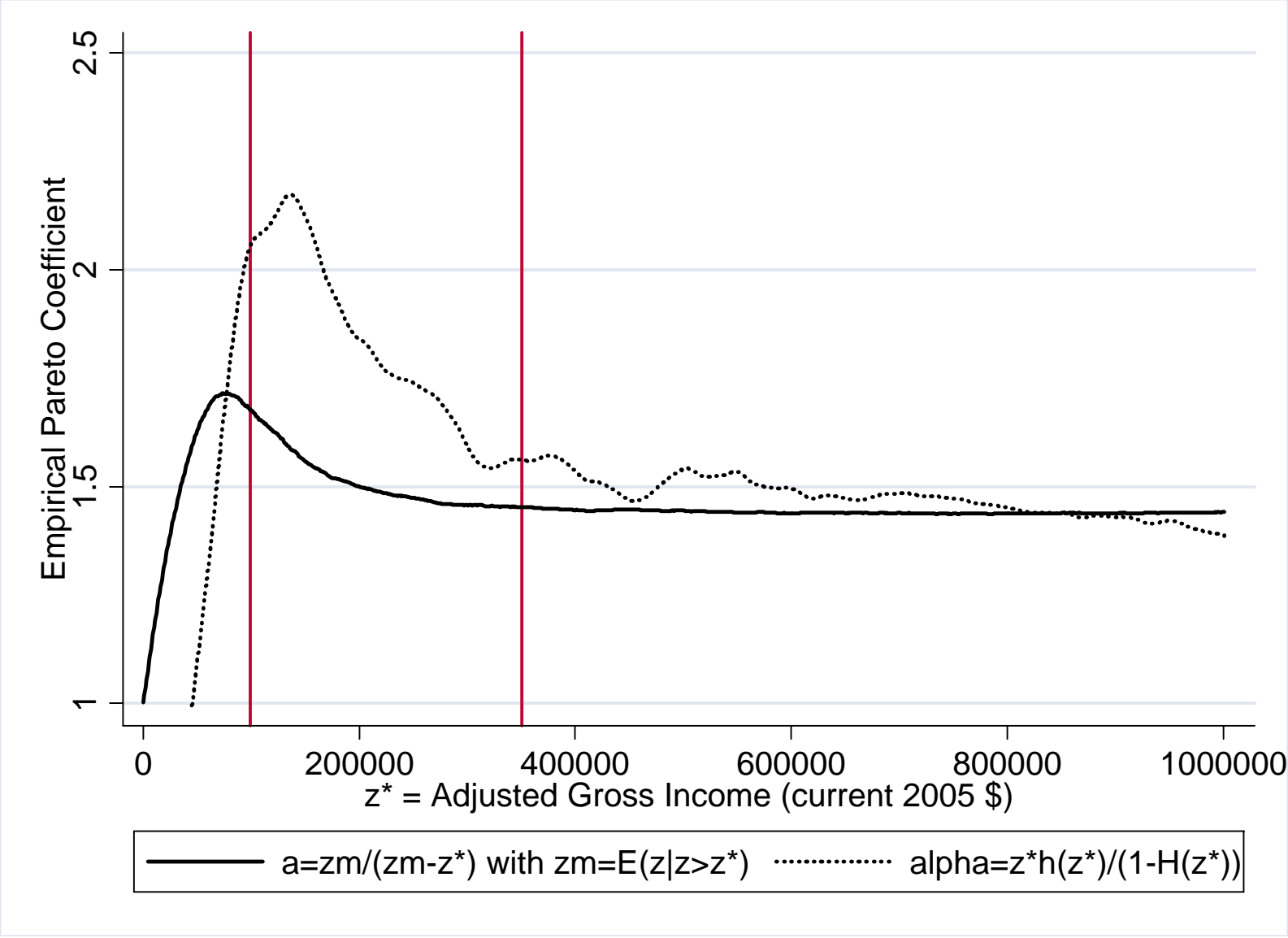
Optimal tax formula  $T'(z)$  [no income effects, Diamond AER'98]

$$T'(z) = \frac{1 - G(z)}{1 - G(z) + \alpha(z) \cdot e(z)}$$

- 1)  $e(z)$  is elasticity at income level  $z$
- 2)  $G(z)$  is the average social marginal welfare weight on individuals above  $z$  ( $G(z) \downarrow z$ )
- 3)  $\alpha(z) = zh(z)/[1 - H(z)]$  is the “local” Pareto parameter, about constant in upper tail

$e(z)$  constant  $\Rightarrow T'(z)$  **increases** toward  $\tau = 1/(1 + a \cdot e)$





## 4. OPTIMAL TRANSFERS AT THE BOTTOM

What is the optimal phase-out rate  $\tau_1$  for transfers? Theoretical literature started with the standard intensive labor supply model

1) Mirrlees '71 provided formal model  $\Rightarrow$  Phase-out rate is positive

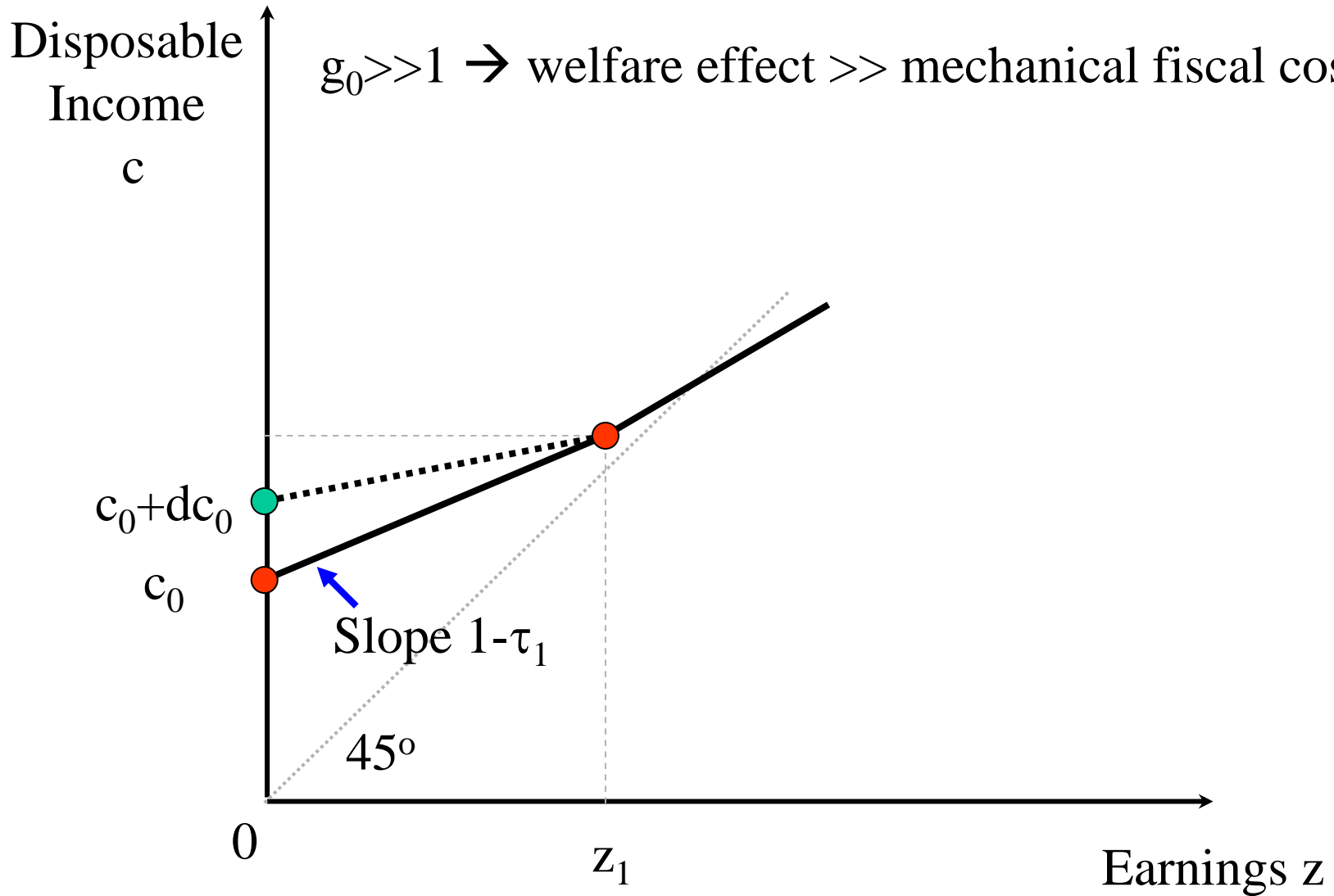
2) Seade '77 zero rate at the bottom: applies only if bottom earnings are positive

3) If (realistically) some have zero earnings, then phasing-out rate at bottom should be high

$\tau_1 = (g_0 - 1)/(g_0 - 1 + e_0)$  where  $g_0$  is social marginal welfare weight at the bottom and  $e_0$  the elasticity of fraction with no earnings wrt to  $1 - \tau_1$

Reform: Increase  $\tau_1$  by  $d\tau_1$  and  $c_0$  by  $dc_0=z_1d\tau_1$

$g_0 \gg 1 \rightarrow$  welfare effect  $\gg$  mechanical fiscal cost

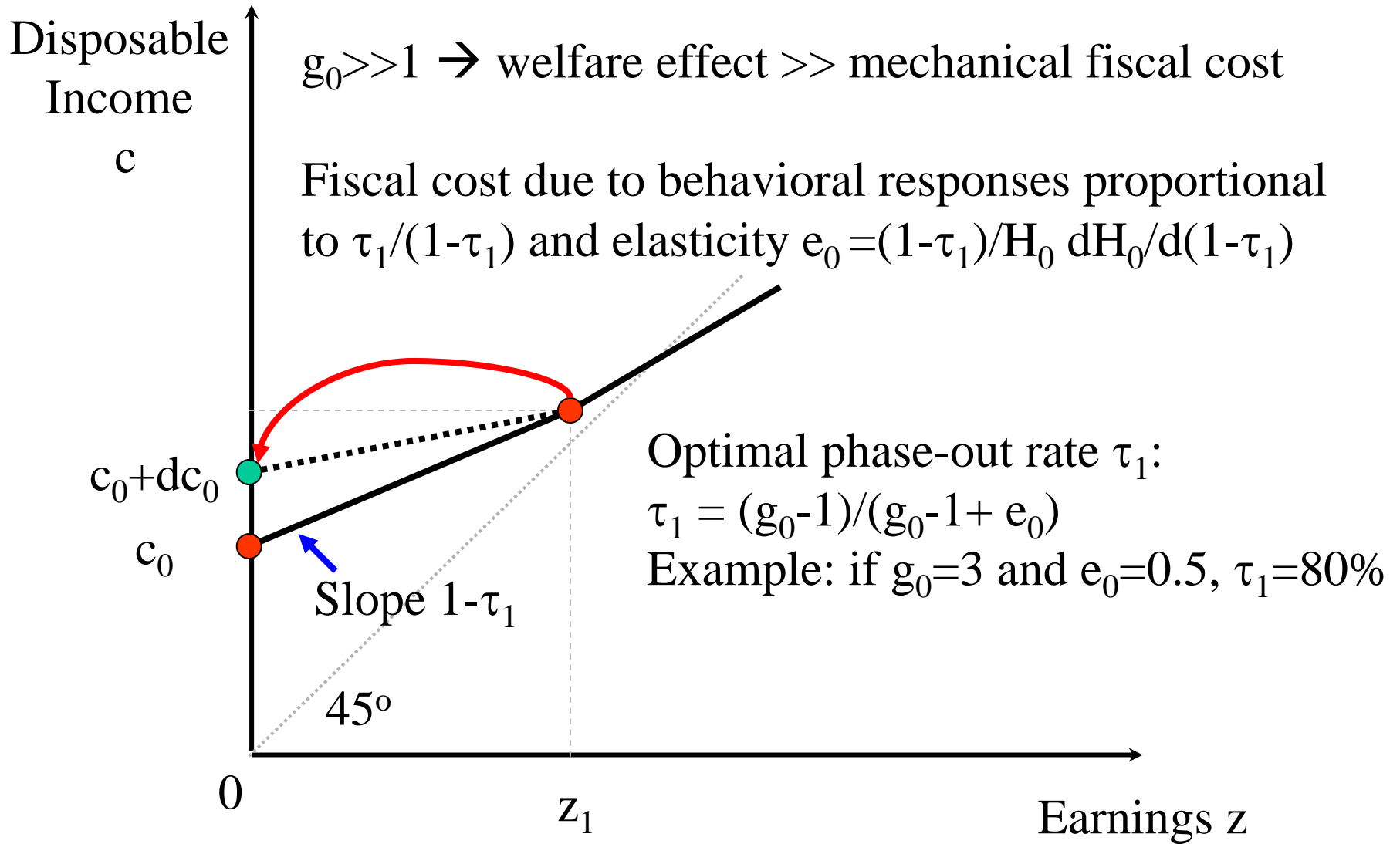




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$g_0 \gg 1 \rightarrow$  welfare effect  $\gg$  mechanical fiscal cost

Fiscal cost due to behavioral responses proportional to  $\tau_1/(1-\tau_1)$  and elasticity  $e_0 = (1-\tau_1)/H_0 dH_0/d(1-\tau_1)$



## 4. OPTIMAL TRANSFERS AT THE BOTTOM

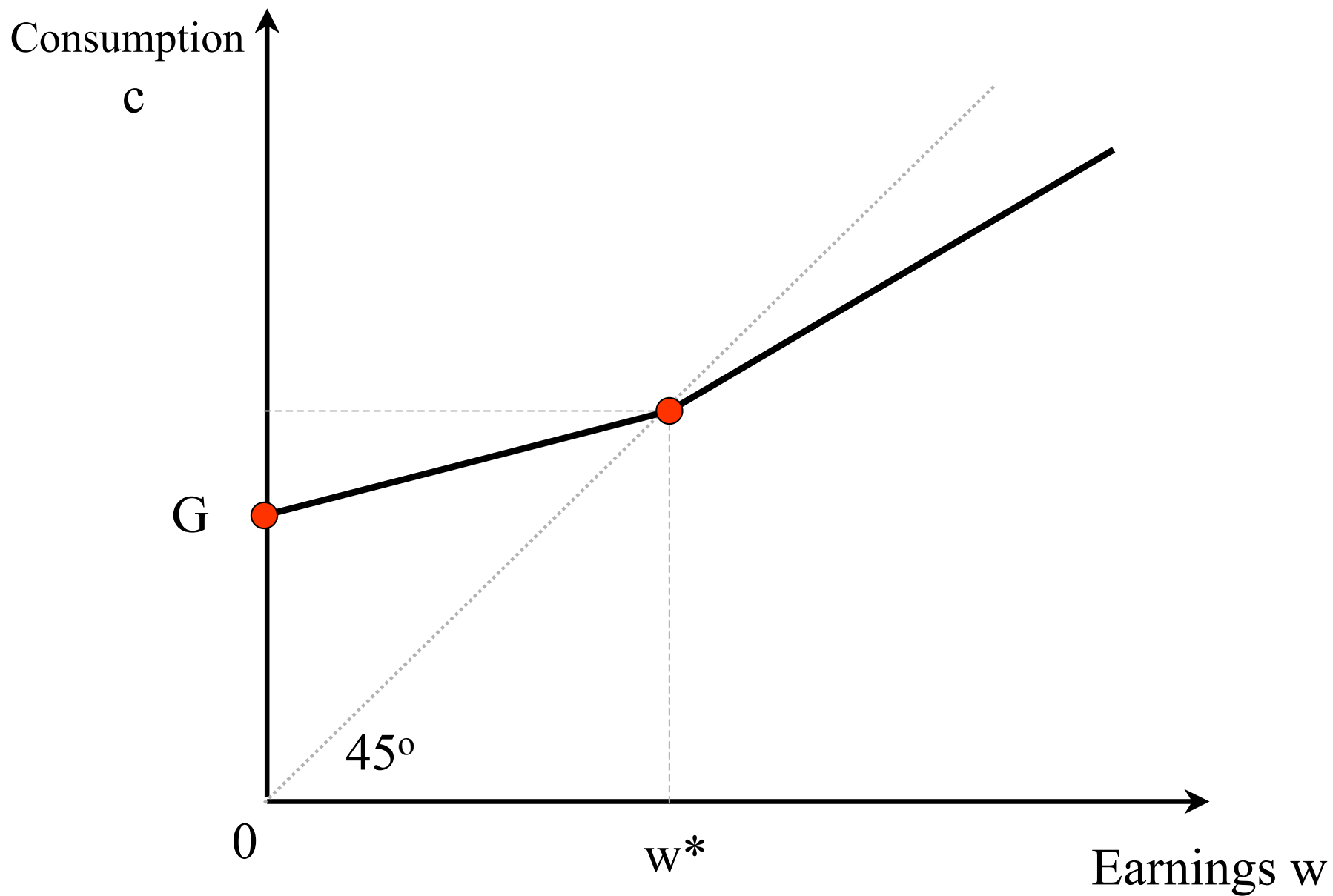
Concern that high phase-out rate discourages labor force participation rather than hours of work on the job [confirmed by empirical studies over last 15-20 years]

Many countries have switched partly from traditional means-tested transfers with high phase-out toward in-work benefits (such as EITC in the US) to reward work

With **extensive** labor supply responses at the bottom, a negative phasing-out rate at the bottom (i.e., in-work benefit) is optimal (Diamond '80, Saez '02)

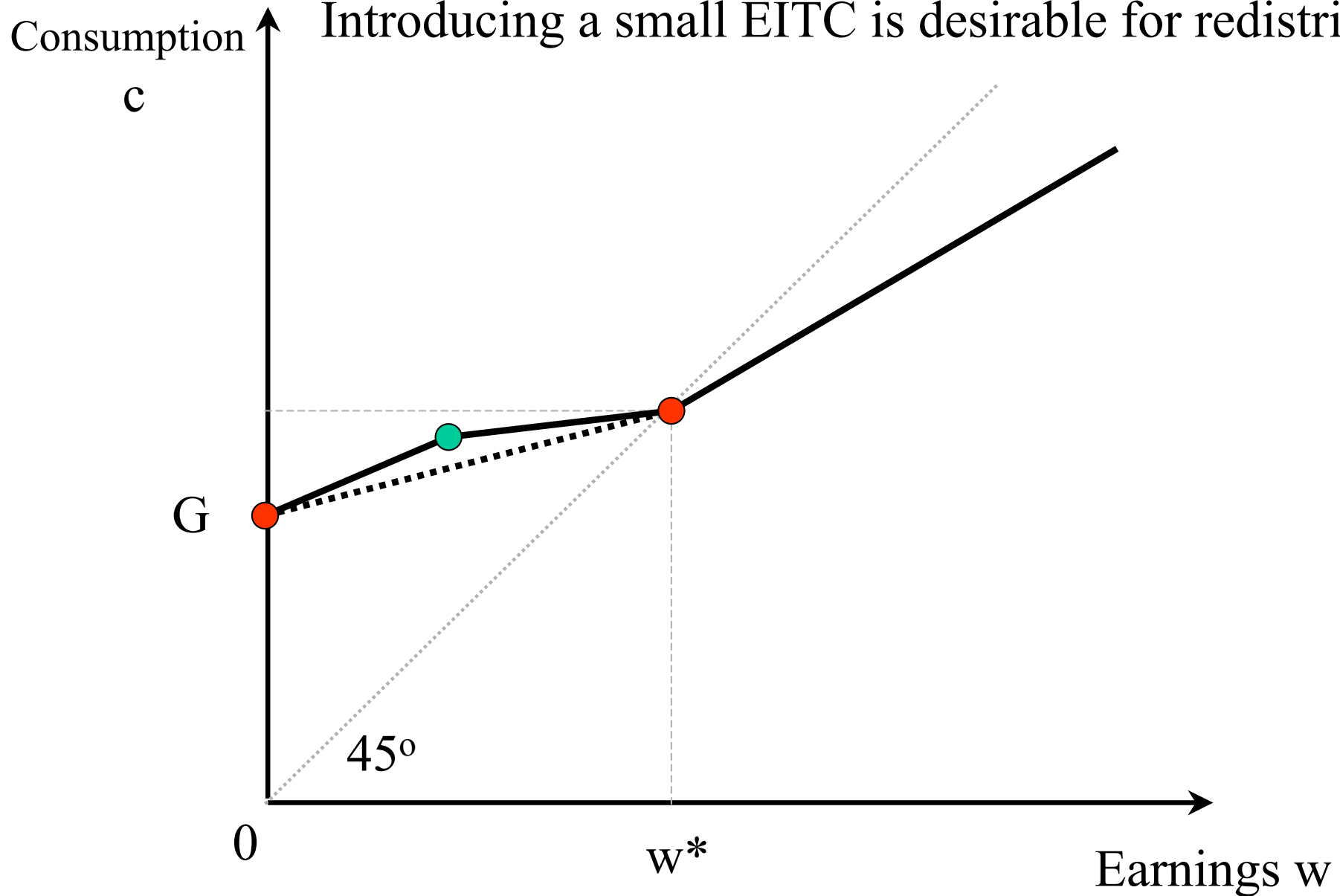
⇒ Low earners should be subsidized on the margin

# Starting from a Means-Tested Program



# Starting from a Means-Tested Program

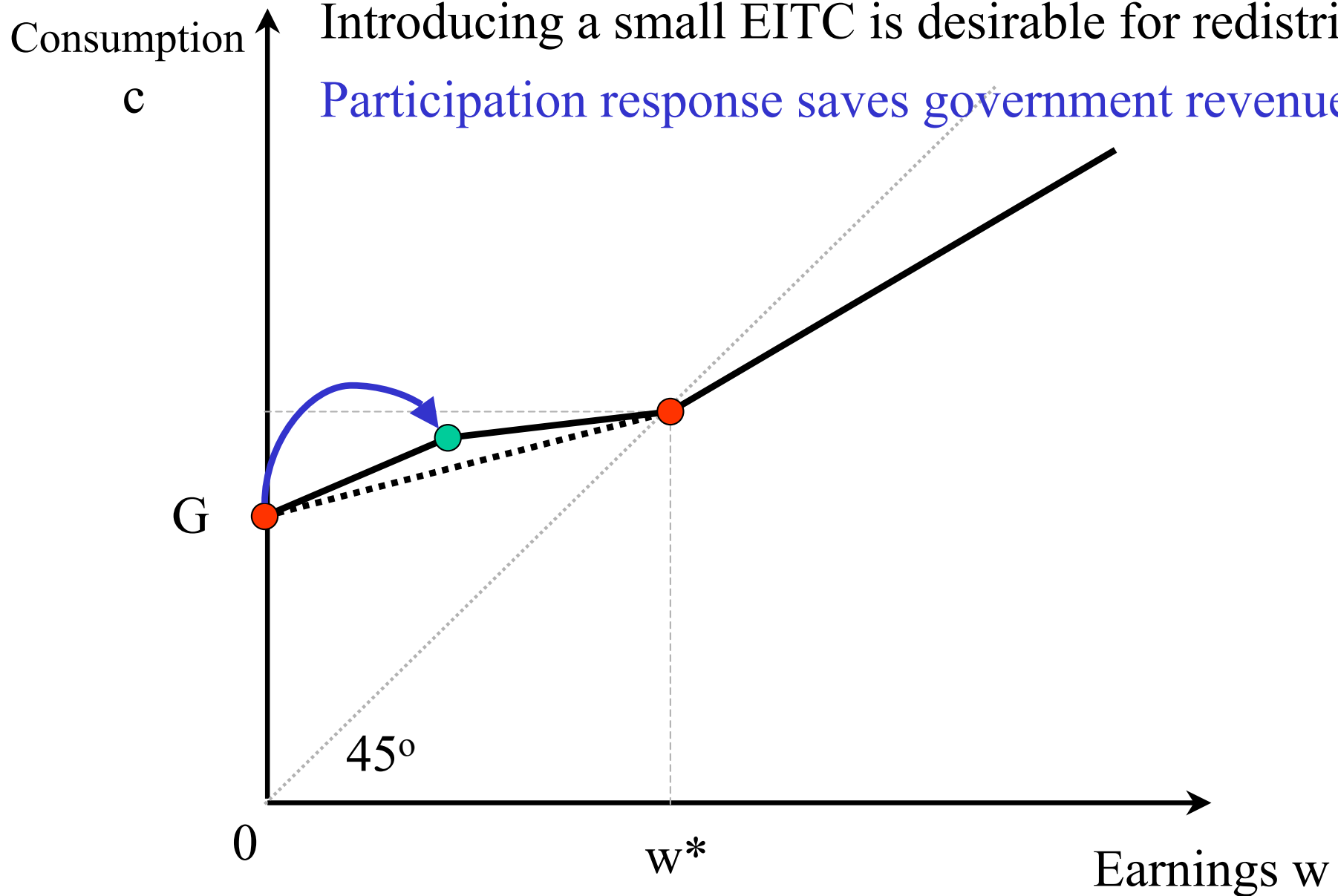
Introducing a small EITC is desirable for redistribution



# Starting from a Means-Tested Program

Introducing a small EITC is desirable for redistribution

Participation response saves government revenue

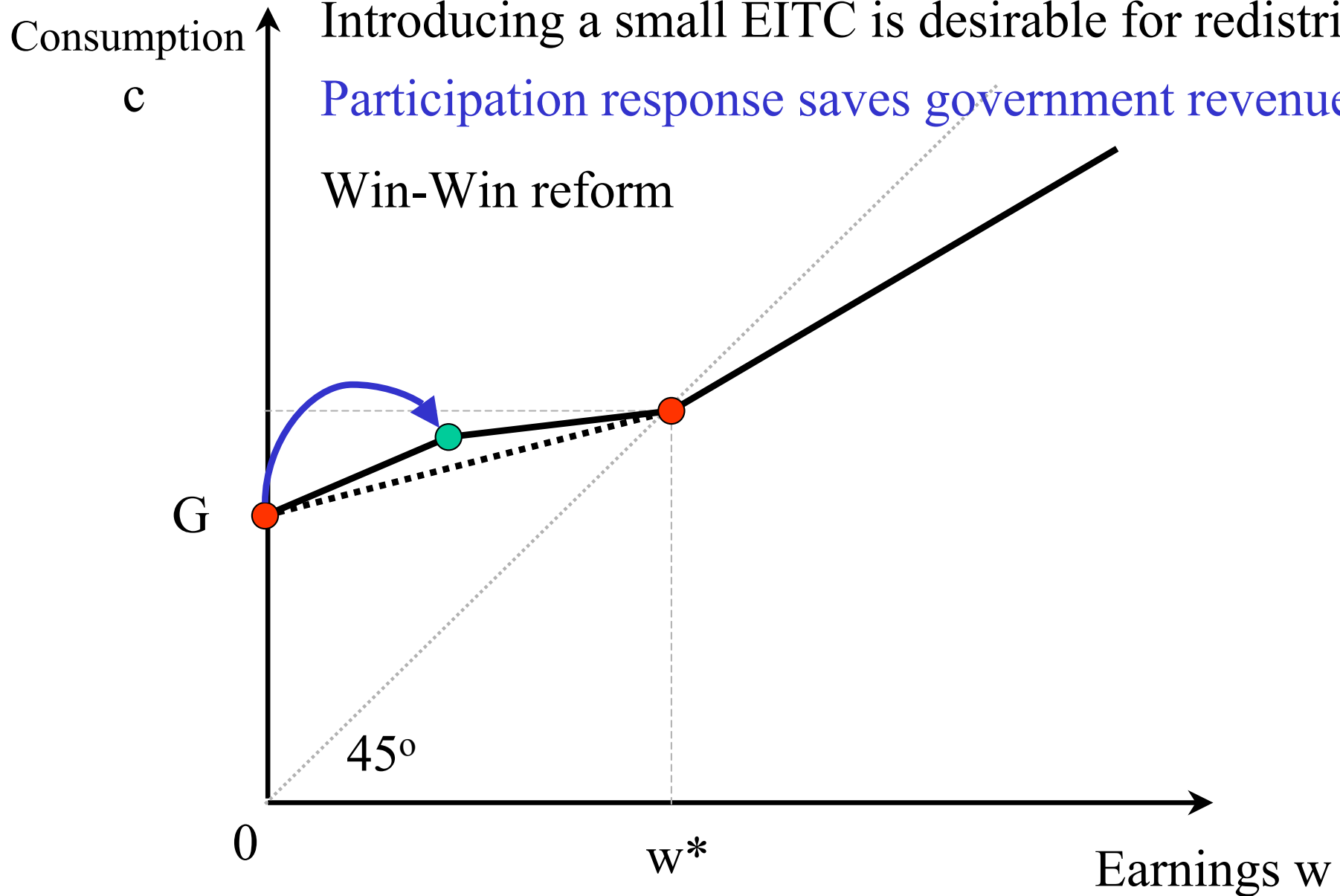


# Starting from a Means-Tested Program

Introducing a small EITC is desirable for redistribution

Participation response saves government revenue

Win-Win reform

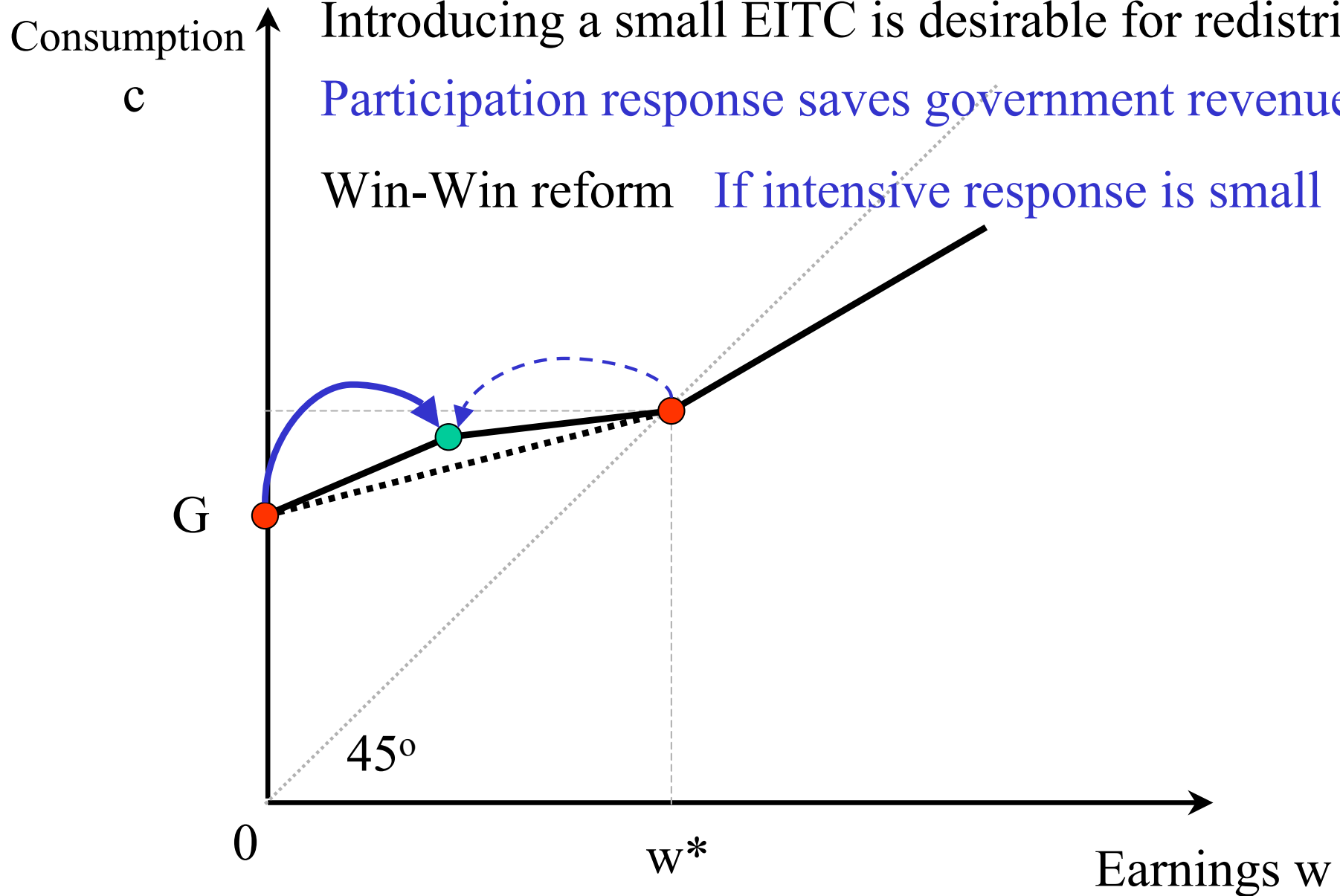


# Starting from a Means-Tested Program

Introducing a small EITC is desirable for redistribution

Participation response saves government revenue

Win-Win reform If intensive response is small



## NORMATIVE PUZZLES OF UTILITARIANISM

**1) Too Little Tagging:** Taxes and transfers should depend on all characteristics correlated with earnings potential (age, race, gender, height, education, family composition, etc.)

**2) Fairness Perceptions:** Utilitarian redistributive concerns are disconnected from process/behavior creating inequality. In practice, fairness perceptions of income process play critical role in views about taxes/transfers

**3) Behavioral Biases:** (a) Tax increases more painful than tax decreases, (b) Asymmetry between deserving taxpayers vs. transfer recipients, (c) Framing effects: taxes/transfer matter individually not only the net  $T(z)$ , (d) Relative income effects

Large literature in Social Choice develops alternative social objectives but tends to be very theoretical and optimal outcome sometimes Pareto dominated (Kaplow '08, Fleurbaey '08 books)



## ENDOGENOUS SOCIAL WELFARE WEIGHTS

A simple reduced form way to capture such non-standard effects is to assume that social marginal welfare weights  $g^i$  are not derived from a standard  $SWF$  but determined endogenously by views and perceptions (Saez and Stantcheva 2011)

⇒ Standard optimal tax formulas as a function of the  $g^i$  and the behavioral elasticities continue to apply

⇒ Optimum no longer maximizes an objective but is an equilibrium: no small reform around the equilibrium is desirable

Wide latitude to set the  $g^i$  to reflect social views, having the  $g^i \geq 0$  guarantees a constrained Pareto efficient outcome

Future research: understand what shapes the  $g^i$  endogenous weights

## CONCLUSIONS

1) Recent literature has been successful in integrating theory with empirical work

⇒ Provides a theory reasonably robust with clear economic intuitions that can be brought to data

2) Important limitations of both theory and empirical analysis remain

a) Empirical work: Relatively easy to measure responses of taxable income but anatomy of the response (real, avoidance, rent-seeking) is hard to measure and yet critical for optimal tax

b) Theory: Utilitarianism has severe limitations. Need more focus on how social preferences are shaped