Graduate Public Economics

Optimal Labor Income Taxes/Transfers

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TAXATION AND REDISTRIBUTION

Key question: By how much should government reduce inequality?

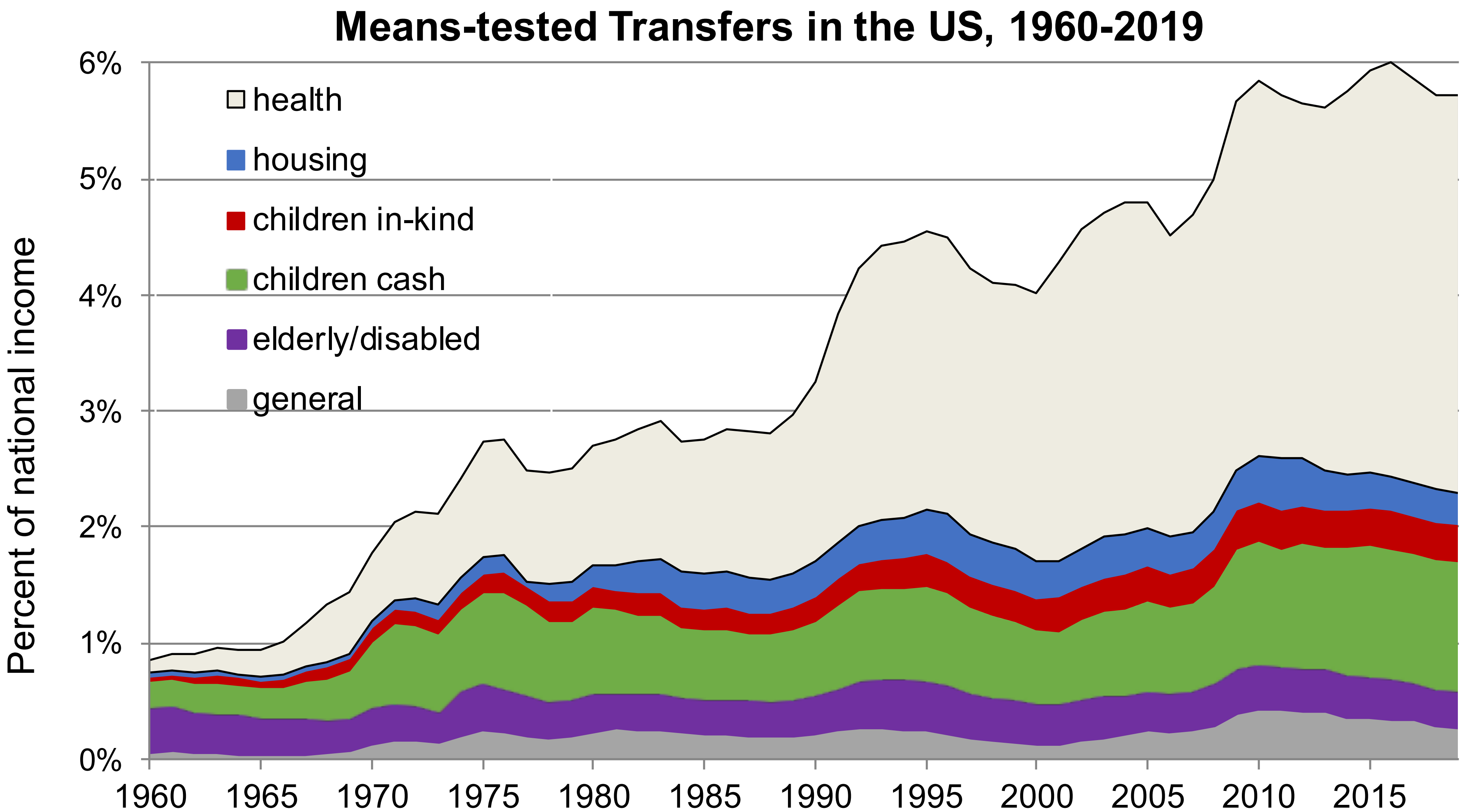
1) Governments use **taxes** to raise revenue

2) This revenue funds **public goods** and **social state**. Social state has 2 components:

a) Universal programs: Education, Health Care (only 65+ in the US), Retirement and Disability

b) Means-tested programs: In-kind (e.g., public housing, nutrition, Medicaid in the US) and cash (direct welfare and refundable tax credits)

Means-tested transfers relatively small relative to universal transfers and generally in-kind and targeted to children. US uses means-tests much more than Europe.



Source. National Accounts. Includes all individualized and means-tested transfers. General is untargetted (SNAP and general assistance for adults). Children cash includes refundable tax credits (EITC+CTC), TANF, and SNAP for children. Health is mostly Medicaid.

FACTS ON US TAXES AND TRANSFERS

References: Comprehensive description in Gruber undergrad textbook (taxes/transfers) and Slemrod-Bakija (taxes)

http://www.taxpolicycenter.org/taxfacts/

A) Taxes: (1) individual income tax (fed+state), (2) payroll taxes on earnings (fed, funds Social Security+Medicare), (3) corporate income tax (fed+state), (4) sales taxes (state)+excise taxes (state+fed), (5) property taxes (state)

B) Means-tested Transfers: (1) refundable tax credits (fed), (2) in-kind transfers (fed+state): Medicaid, public housing, nutrition (SNAP), education (3) cash welfare: TANF for single parents (fed+state), SSI for old/disabled (fed)

FEDERAL US INCOME TAX

US income tax assessed on **annual family** income (not individual) [most other OECD countries have shifted to individual assessment]

Sum all cash income sources from family members (both from labor and capital income sources) = called **Adjusted Gross Income (AGI)**

Main exclusions: fringe benefits (health insurance, pension contributions and returns), imputed rent of homeowners, undistributed corporate profits, unrealized capital gains, interest from state+local bonds

$\Rightarrow$ AGI base is only 70% of national income

FEDERAL US INCOME TAX

Taxable income = AGI - deduction

deduction is max of standard deduction or itemized deductions

Standard deduction is a fixed amount ($15K for singles, $30K for married couple in 2025)

Itemized deductions: (a) state and local taxes paid (only up to $10K since 2018), (b) mortgage interest payments (capped), (c) charitable giving, various small other items

[about 10% of AGI lost through itemized deductions, called tax expenditures]

In 2018+, only 10% of tax filers itemize (30% before 2018)

FEDERAL US INCOME TAX: TAX BRACKETS

Tax $T(z)$ is piecewise linear and continuous function of taxable income z with constant marginal tax rates (MTR) $T'(z)$ by brackets

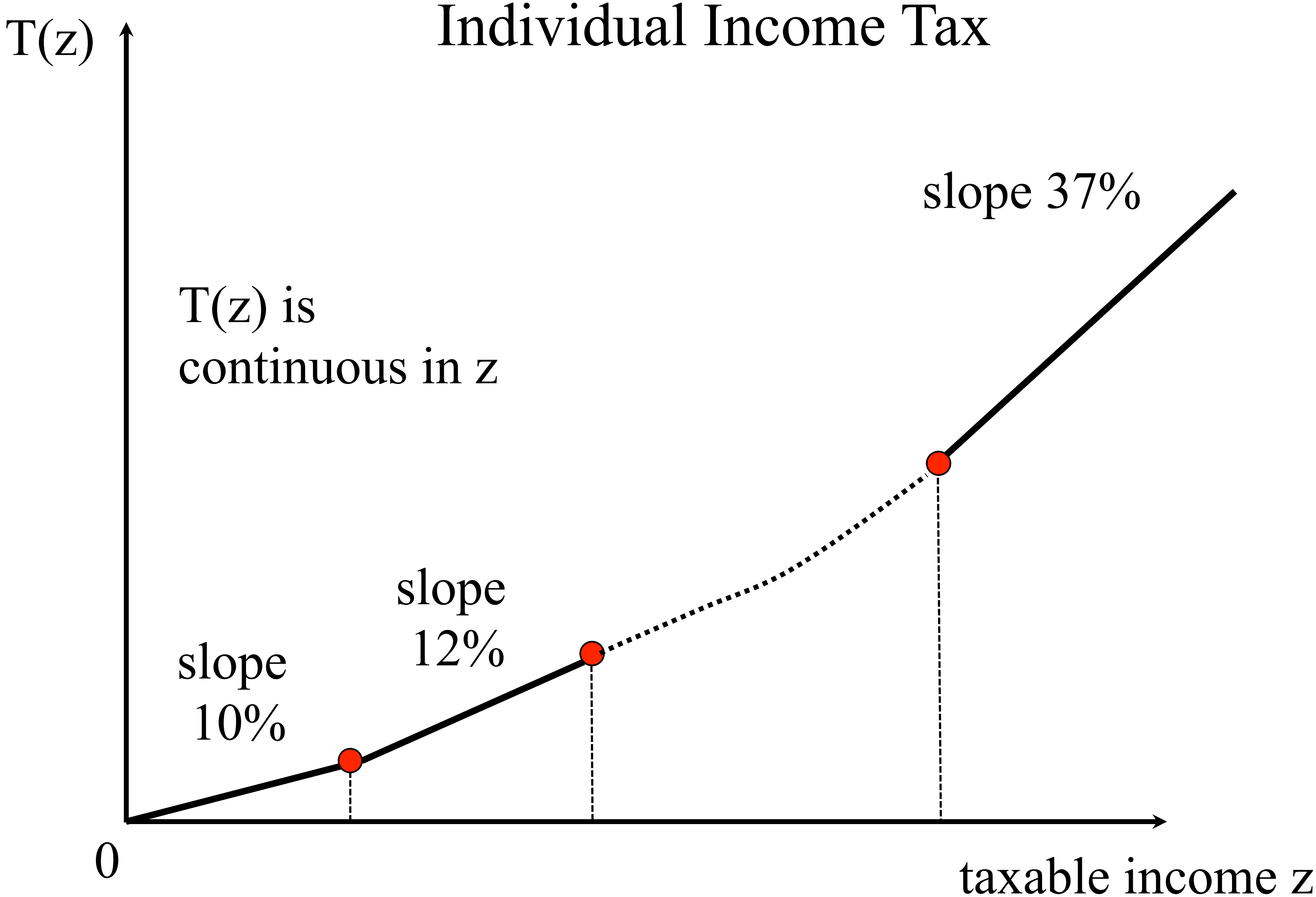
In 2018+, 6 brackets with MTR 10%,12%,22%,24%,32%,35%, 37% (top bracket for z above $650K), indexed on price inflation

Lower preferential rates (up to a max of 20%) apply to dividends (since 2003), realized capital gains [in part to offset double taxation of corporate profits].

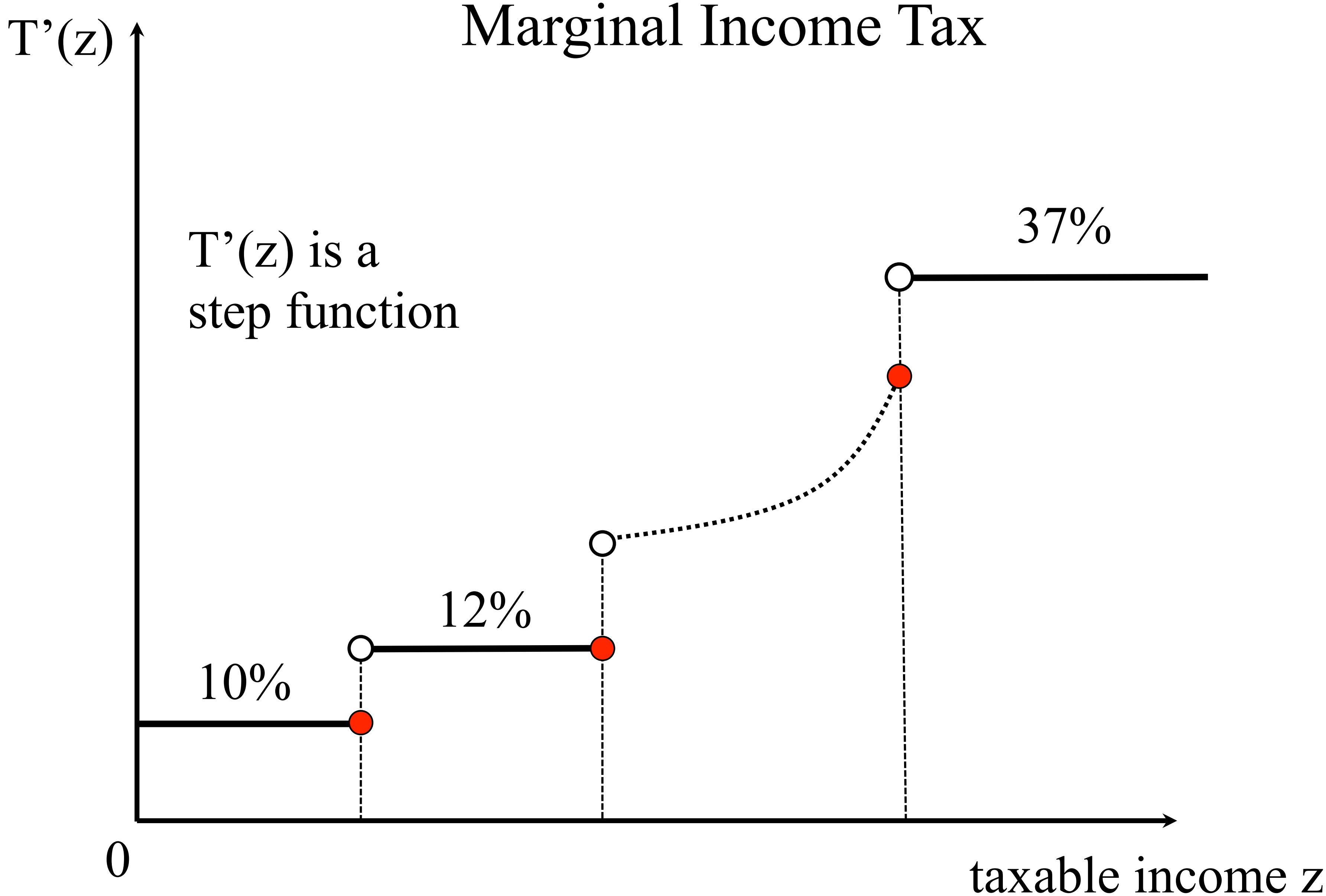
20% of profits of passthrough businesses (taxed solely by individual tax) are exempt since 2018

Tax rates change frequently over time. Top MTRs have declined drastically since 1960s (as in many OECD countries)

Individual Income Tax

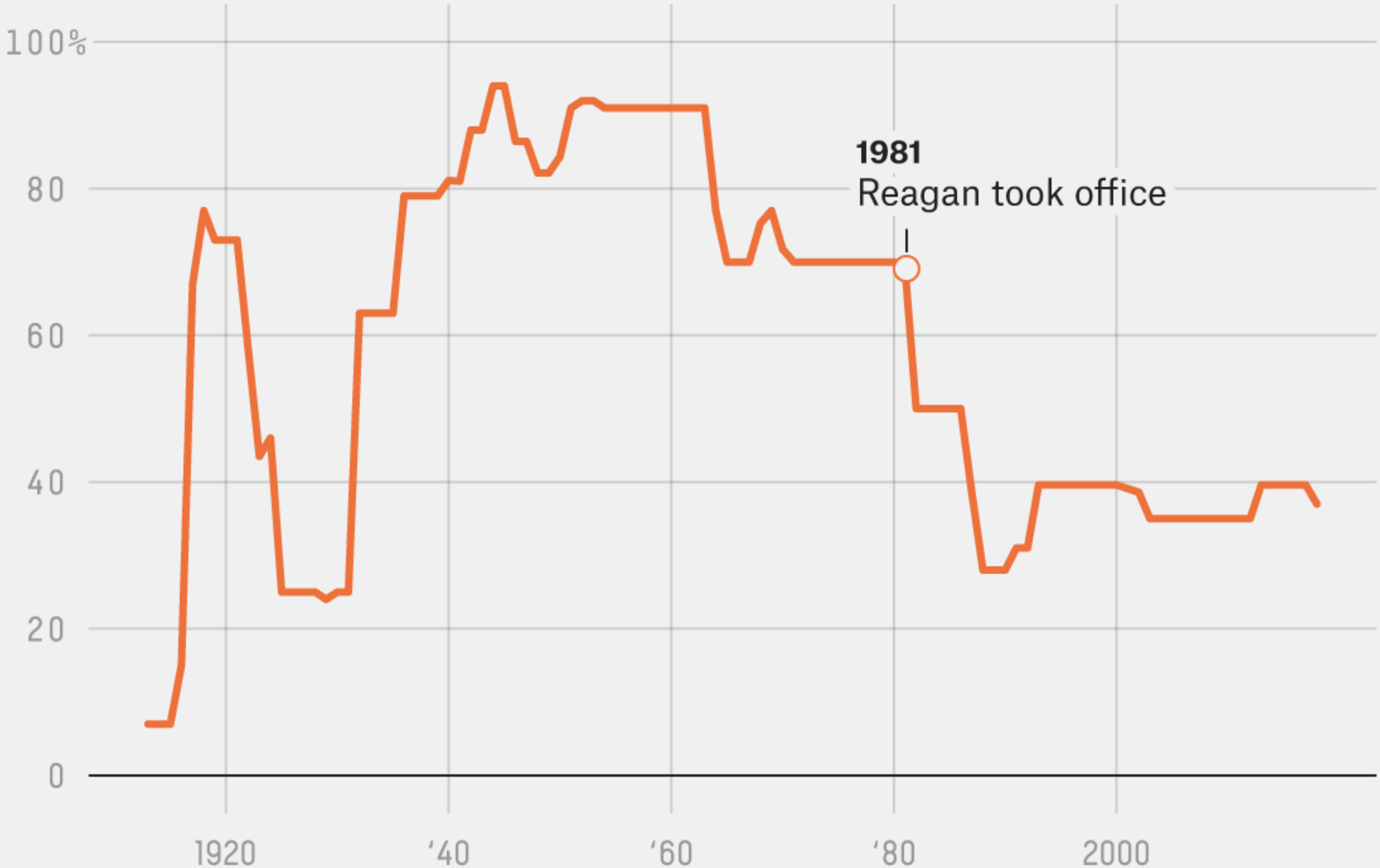


Marginal Income Tax



Historically, a 70 percent marginal tax rate is not unusual

The top marginal income tax rates from 1913 to 2018



FiveThirtyEight

SOURCE: TAX POLICY CENTER

FEDERAL US INCOME TAX: TAX CREDITS

Tax credits: Additional reduction in taxes

(1) **Non refundable** (cannot reduce taxes below zero): e.g., foreign tax credit, education credits, energy credits

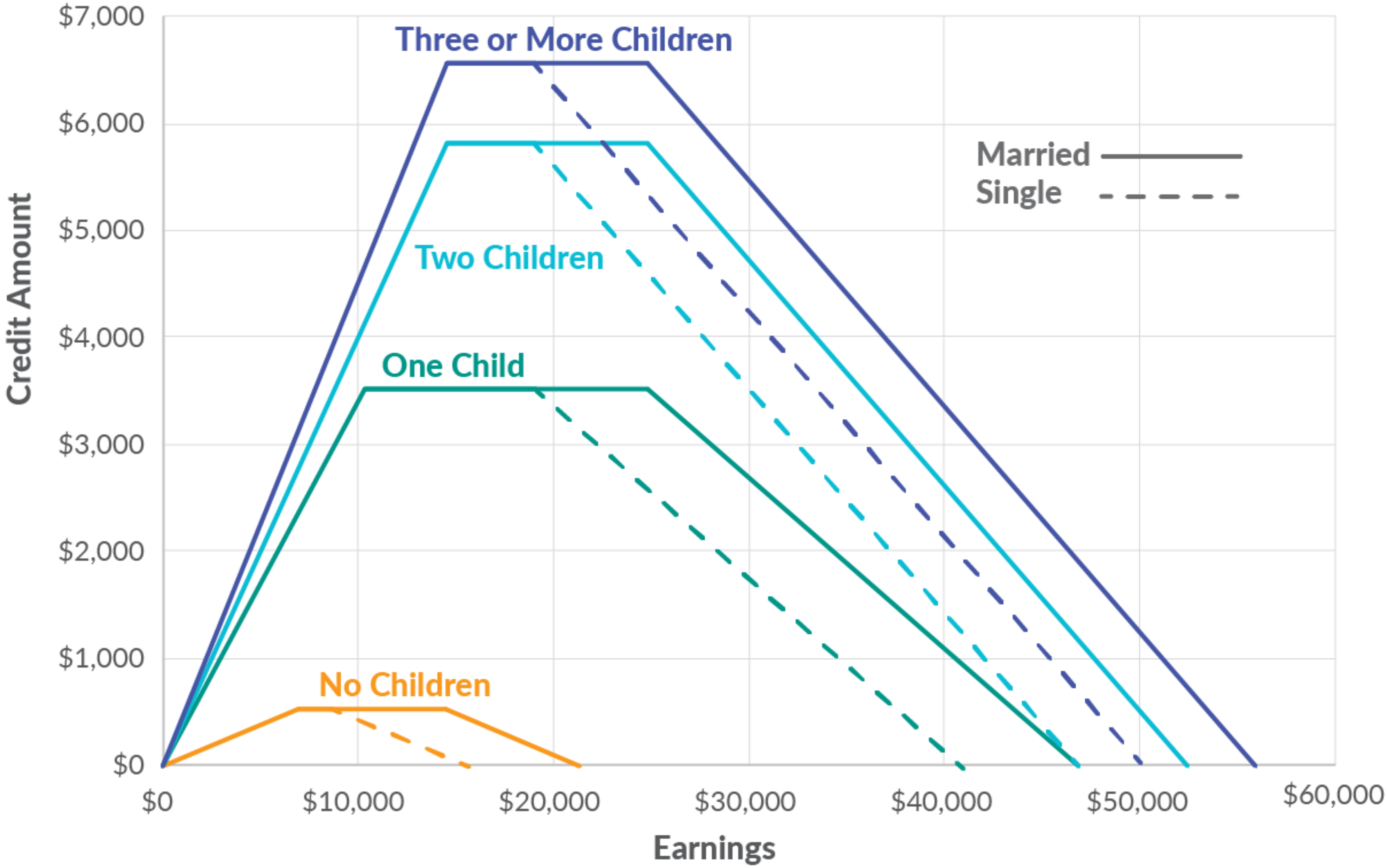
(2) **Refundable** (can reduce taxes below zero, i.e., be net transfers): EITC (earned income tax credit, up to $4.3K, $7.1K, $8.0K for working families with 1, 2, 3+ kids, indexed), Child Tax Credit ($2K per kid, partly refundable)

2021: Child tax credit expanded to $3K per kid and fully refundable but not extended beyond 2021

Refundable credits have become the largest means-tested cash transfer in the US

The Phase-In and Phaseout of the EITC

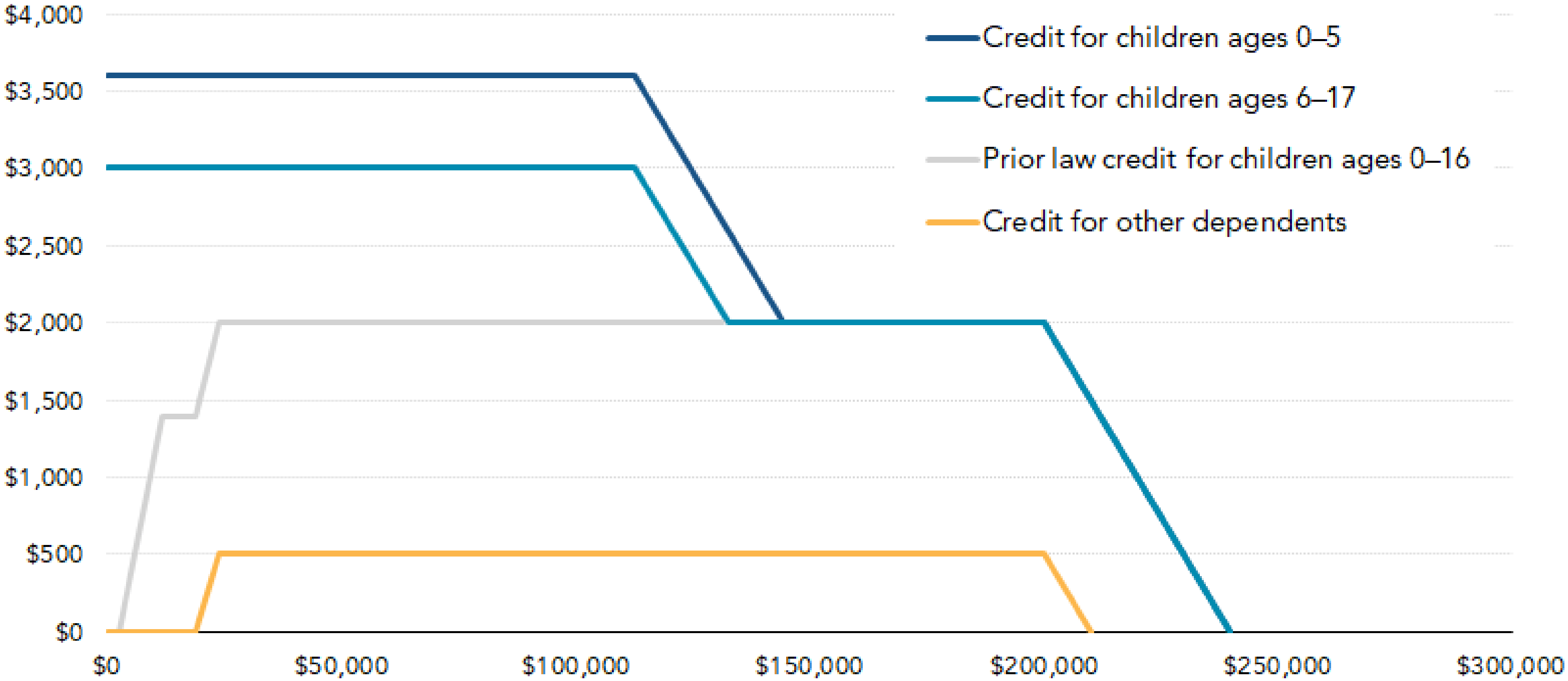
Credit Amount by Marital Status and Number of Children



Source: Amir El-Sibaie, "2019 Tax Brackets," Tax Foundation, Nov. 28, 2018.

FIGURE 1

Child Tax Credit, Single Parent
For one child, tax year 2021



Source: Urban-Brookings Tax Policy Center calculations.
Notes: Assumes all income comes from earnings, and child meets all tests to be a CTC-qualifying dependent. $3,000 and $3,600 credits are fully refundable; prior law limited refunds to $1,400 out of the maximum $2,000 credit. Credit for married parents first phases out at $150,000 of income until credit reaches pre-2021 level; begins second phase out at $400,000 of income. Only citizen children qualify for the $3,000 and $3,600 credits for children under 18. Noncitizens under age 18 who meet the dependency tests of eligibility can qualify other dependent credit.

Basic Income vs. Means-tested transfer: Mankiw quiz

Consider an economy in which average income is $50,000 but with much income inequality. To provide a social safety net, two possible policies are proposed.

A. A universal transfer of $10,000 to every person, financed by a 20-percent flat tax on all incomes.

B. A means-tested transfer of $10,000. The full amount goes to someone without any income. The transfer is then phased out: You lose 20 cents of it for every dollar of income you earn. These transfers are financed by a tax of 20 percent on income above $50,000.

Which would you prefer?

Basic Income vs. Means-tested transfer

Basic income definition: all people receive an unconditional sum of money (every year) regardless of how much they earn

This is the R of the linear tax system $c = (1 - \tau) \cdot z + R$

Or the $-T(0) > 0$ of the nonlinear tax system $c = z - T(z)$

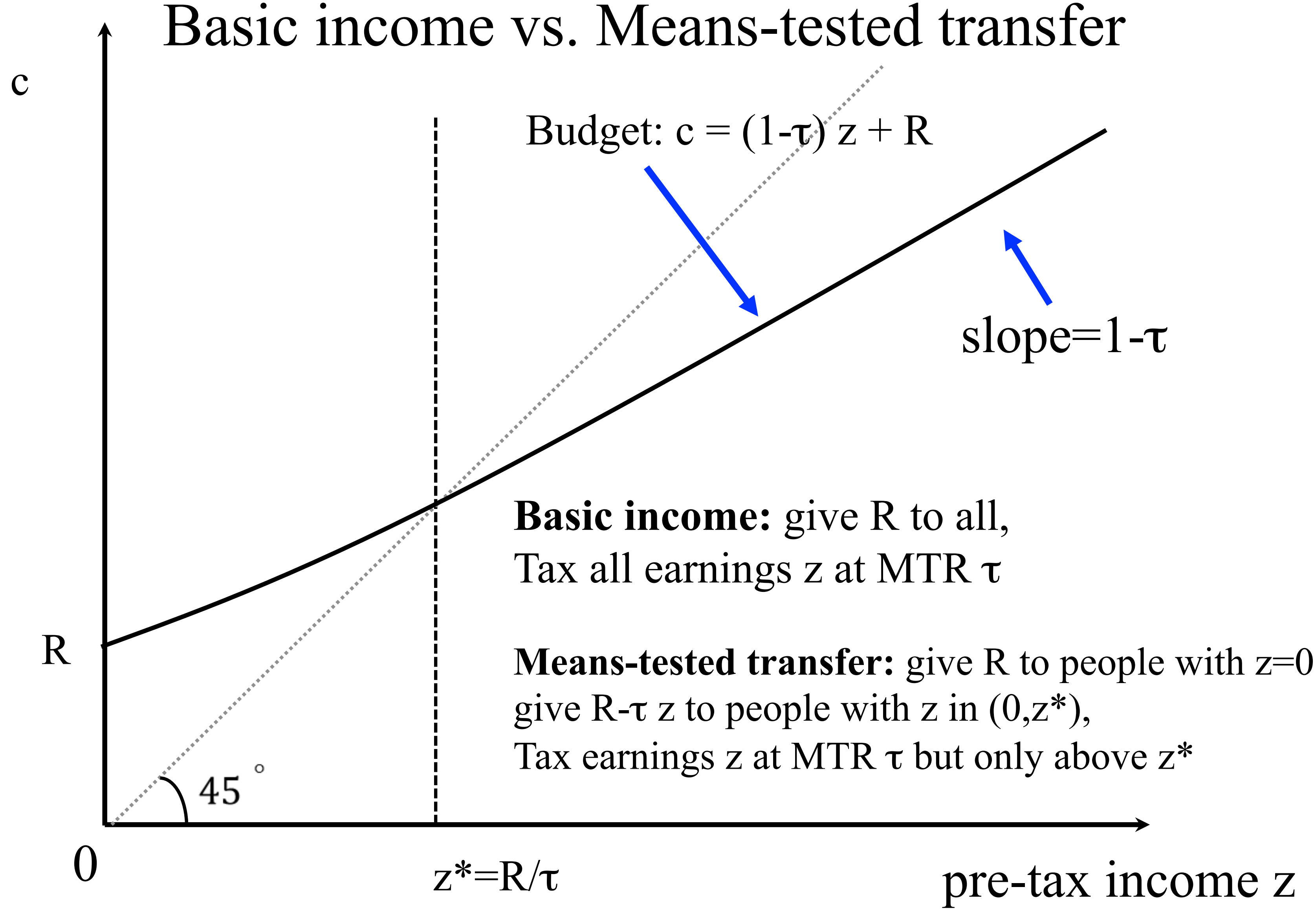
Basic income for everybody + higher taxes to fund it is **economically equivalent** to means-tested transfer Pro basic income: less stigmatizing than means-tested transfer

Cons: basic income requires higher "nominal" taxes

Pros: Much more widely accepted. Countries provide "in-kind" basic income in the form of universal health care (not the US), public education, and child allowances

Economists blind to these important features

Basic income vs. Means-tested transfer



Basic income: give R to all,
Tax all earnings z at MTR τ

Means-tested transfer: give R to people with z=0,
give R-τ z to people with z in (0,z*),
Tax earnings z at MTR τ but only above z*

Modern social state and fairness

Taxes roughly proportional to income = tax **rate** roughly equal across groups = broad fairness appeal in isolation

Social transfers (child care, education, health) roughly equal per person and de-commodified = everybody gets access to quality education and health care = broad fairness appeal

Very redistributive combination but somewhat hidden
$\Rightarrow$ Successful large social state (EU countries)

Means-tested transfers are economically equivalent but reveal the redistribution $\Rightarrow$ Less generous social state (US)

See Esping-Anderen '90 book for welfare-state regimes sociological analysis

FEDERAL US INCOME TAX: TAX FILING

Taxes on year t earnings are withheld on paychecks during year t (pay-as-you-earn)

Income tax return filed in late January-April 15th, year $t+1$ [filers use either software or tax preparers, big private industry in the US]

Most tax filers get a tax refund as withholdings $>$ taxes owed

Payers (employers, banks, etc.) send income information to tax administration and individuals (3rd party reporting)

Third party reporting + withholding at source is key for successful enforcement

MAIN MEANS-TESTED TRANSFER PROGRAMS

1) **Traditional transfers:** managed by welfare agencies, paid on monthly basis, high stigma and take-up costs $\Rightarrow$ low take-up rates

Main programs: Medicaid (health insurance for low incomes), SNAP (former food stamps), public housing, TANF (traditional welfare), SSI (aged+disabled)

2) **Refundable income tax credits:** managed by tax administration, paid as an annual lumpsum in year $t+1$, low stigma and take-up cost $\Rightarrow$ high take-up rates

Main programs: EITC and Child Tax Credit [large expansion since the 1990s] for low income working families with children

BOTTOM LINE ON ACTUAL TAXES/TRANSFERS

1) Based on current income, family situation, and disability (retirement) status ⇒ Strong link with **current ability to pay**

2) Some allowances made to reward / encourage certain behaviors: charitable giving, home ownership, savings, energy conservation, and work for low earners (refundable tax credits such as EITC)

3) Provisions pile up overtime making tax/transfer system more and more complex until significant simplifying reform happens (such as US Tax Reform Act of 1986, or TCJA 2018)

KEY CONCEPTS FOR TAXES/TRANSFERS

1) Transfer benefit with zero earnings $-T(0)$ [sometimes called demogrant or lumpsum grant]

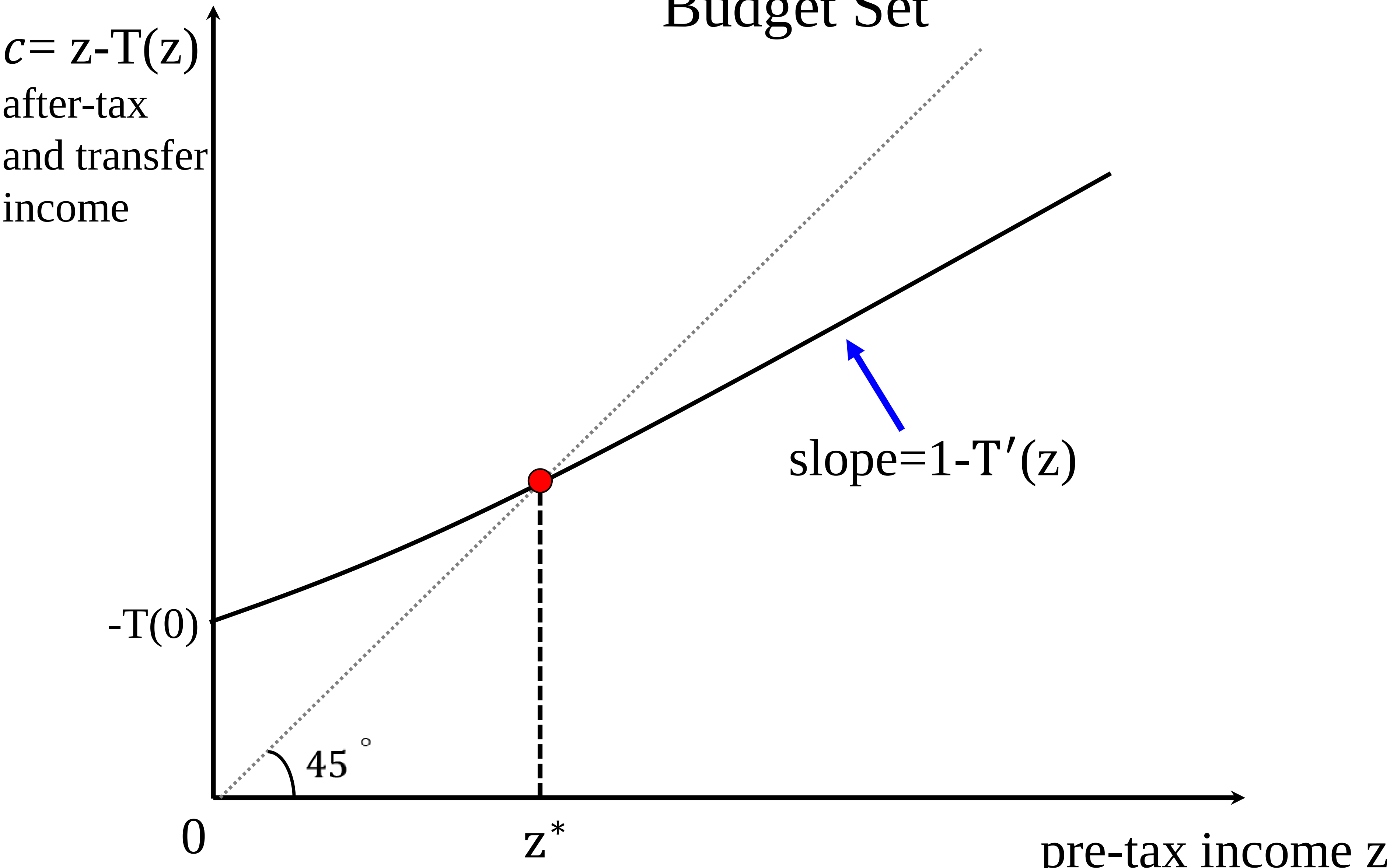
2) Marginal tax rate (or phasing-out rate) $T'(z)$: individual keeps $1-T'(z)$ for an additional $1 of earnings (intensive labor supply response)

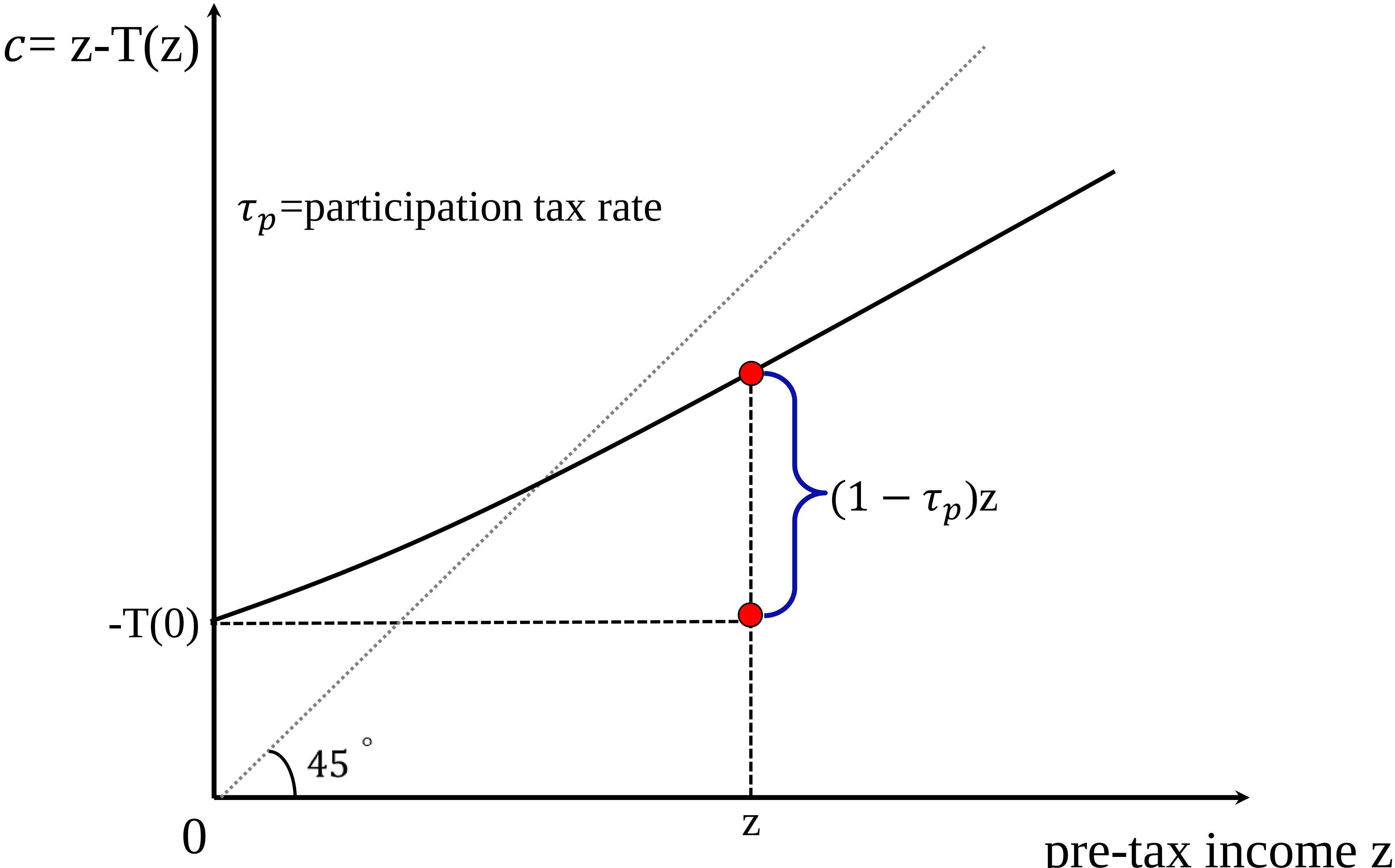
3) Participation tax rate $\tau_p = [T(z)-T(0)]/z$: individual keeps fraction $1-\tau_p$ of earnings when moving from zero earnings to earnings z (extensive labor supply response):

$$z - T(z) = -T(0) + z - [T(z) - T(0)] = -T(0) + z \cdot (1 - \tau_p)$$

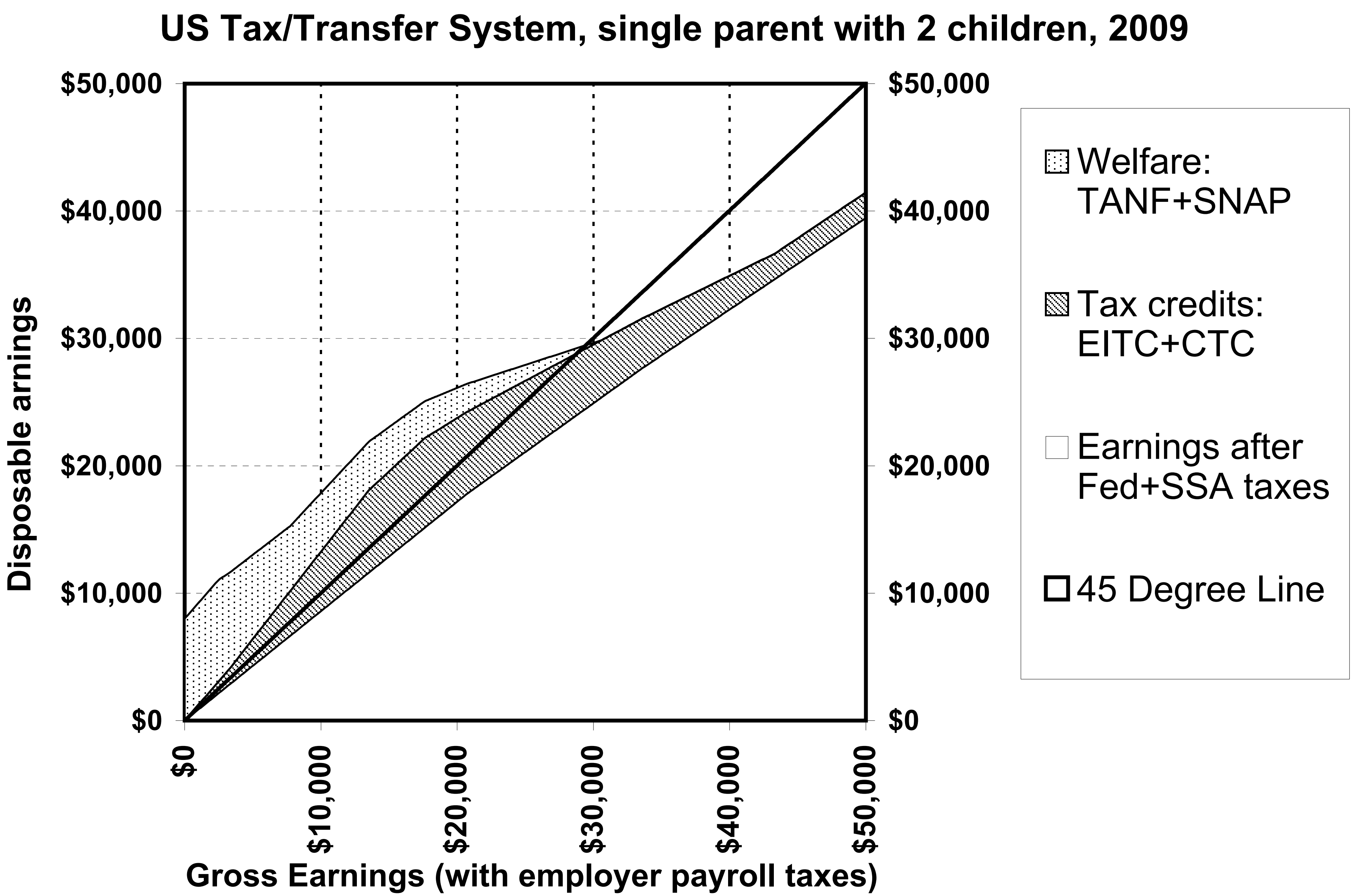
4) Break-even earnings point z^*: point at which $T(z^*) = 0$

Budget Set

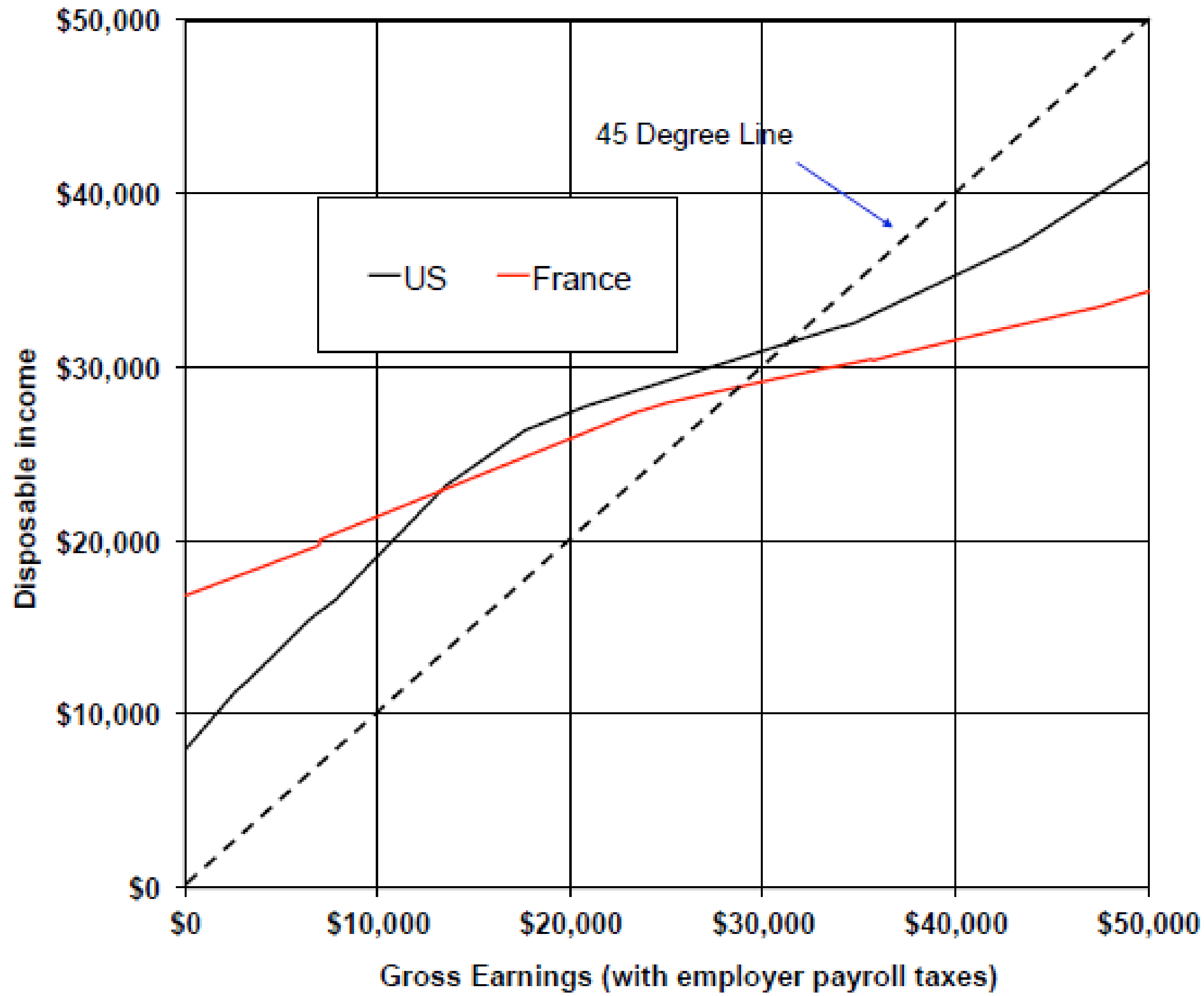

c= z-T(z)
after-tax
and transfer
income
-T(0)
45 °
0
z*
pre-tax income z
slope=1-T′(z)



c= z-T(z)
τ_p=participation tax rate
$(1-\tau_p)$z
-T(0)
45 °
0
z
pre-tax income z



Source: Federal Govt



Source: Piketty, Thomas, and Emmanuel Saez (2012)

OPTIMAL TAXATION: SIMPLE MODEL WITH NO BEHAVIORAL RESPONSES

Utility $u(c)$ strictly increasing and concave

Same for everybody where c is after tax income.

Income is z and is fixed for each individual, $c = z - T(z)$ where $T(z)$ is tax on z. z has density distribution $h(z)$

Government maximizes **Utilitarian** objective:

$$\int_0^\infty u(z - T(z))h(z)dz$$

subject to **budget constraint** $\int T(z)h(z)dz \geq E$ (multiplier λ)

SIMPLE MODEL WITH NO BEHAVIORAL RESPONSES

Form lagrangian: $L = [u(z - T(z)) + \lambda \cdot T(z)] \cdot h(z)$

First order condition (FOC) in $T(z)$:

$$0 = \frac{\partial L}{\partial T(z)} = [-u'(z - T(z)) + \lambda] \cdot h(z) \Rightarrow u'(z - T(z)) = \lambda$$

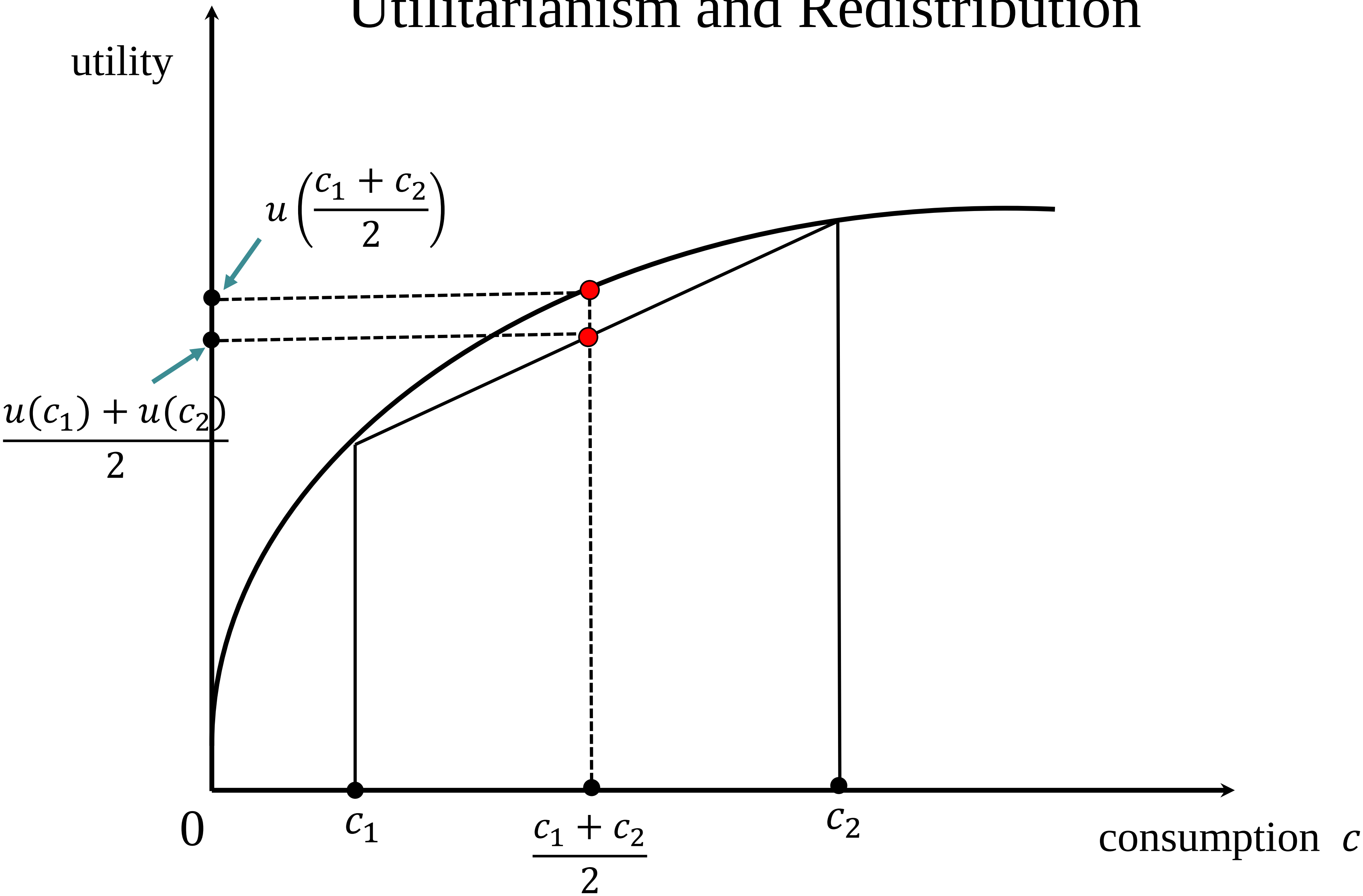
$\Rightarrow z - T(z) =$ constant for all z.

$\Rightarrow c = \bar{z} - E$ where $\bar{z} = \int z h(z) dz$ average income.

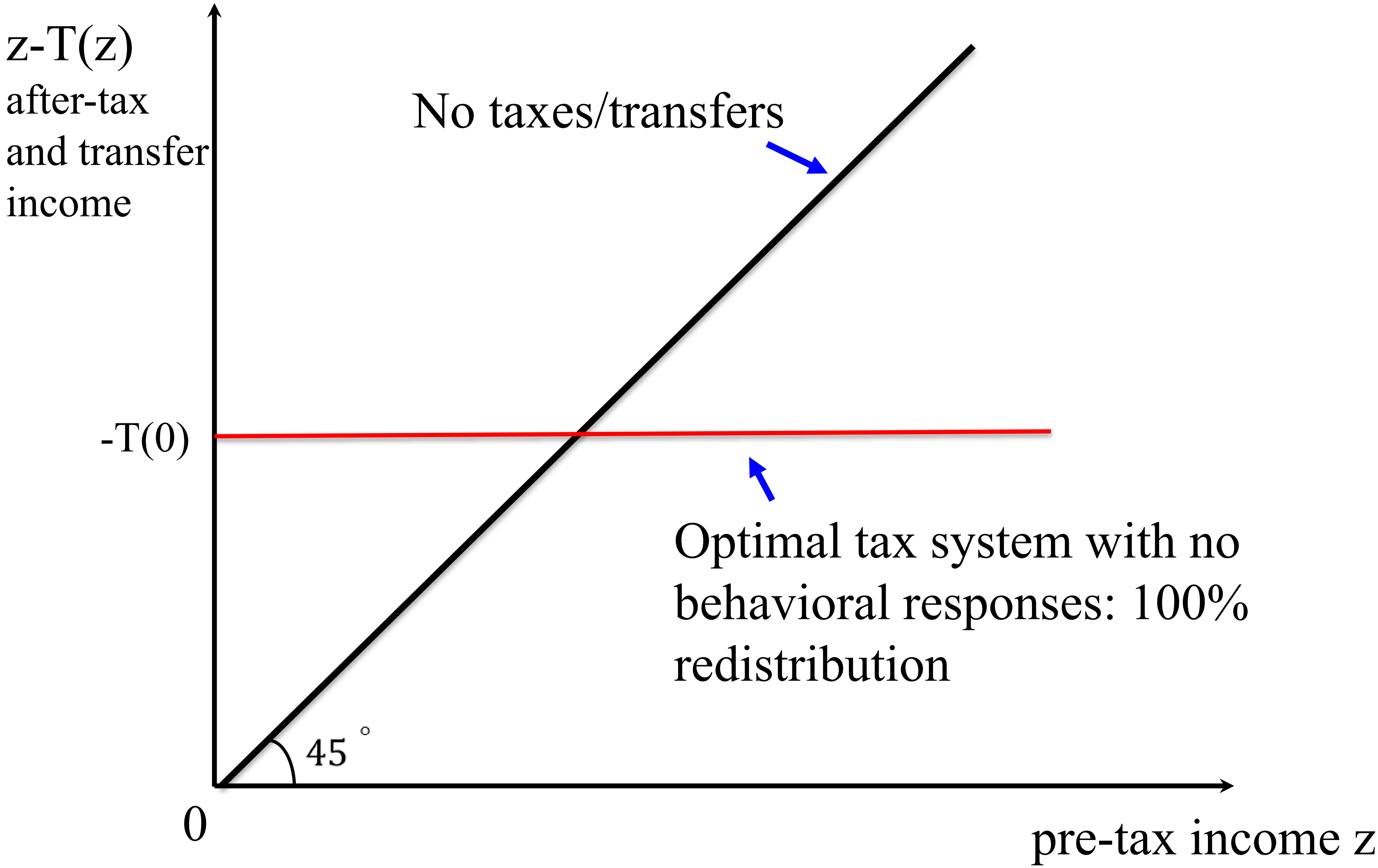
100% marginal tax rate. Perfect equalization of after-tax income.

Utilitarianism with decreasing marginal utility leads to perfect egalitarianism [Edgeworth, 1897]

Utilitarianism and Redistribution



Optimal Tax/Transfer Systems



ISSUES WITH SIMPLE MODEL

1) **No behavioral responses:** Obvious missing piece: 100% redistribution would destroy incentives to work and thus the assumption that z is exogenous is unrealistic

$\Rightarrow$ Optimal income tax theory incorporates behavioral responses $u(\underset{+}{c}, \underset{-}{z})$ (Mirrlees REStud '71): **equity-efficiency trade-off**

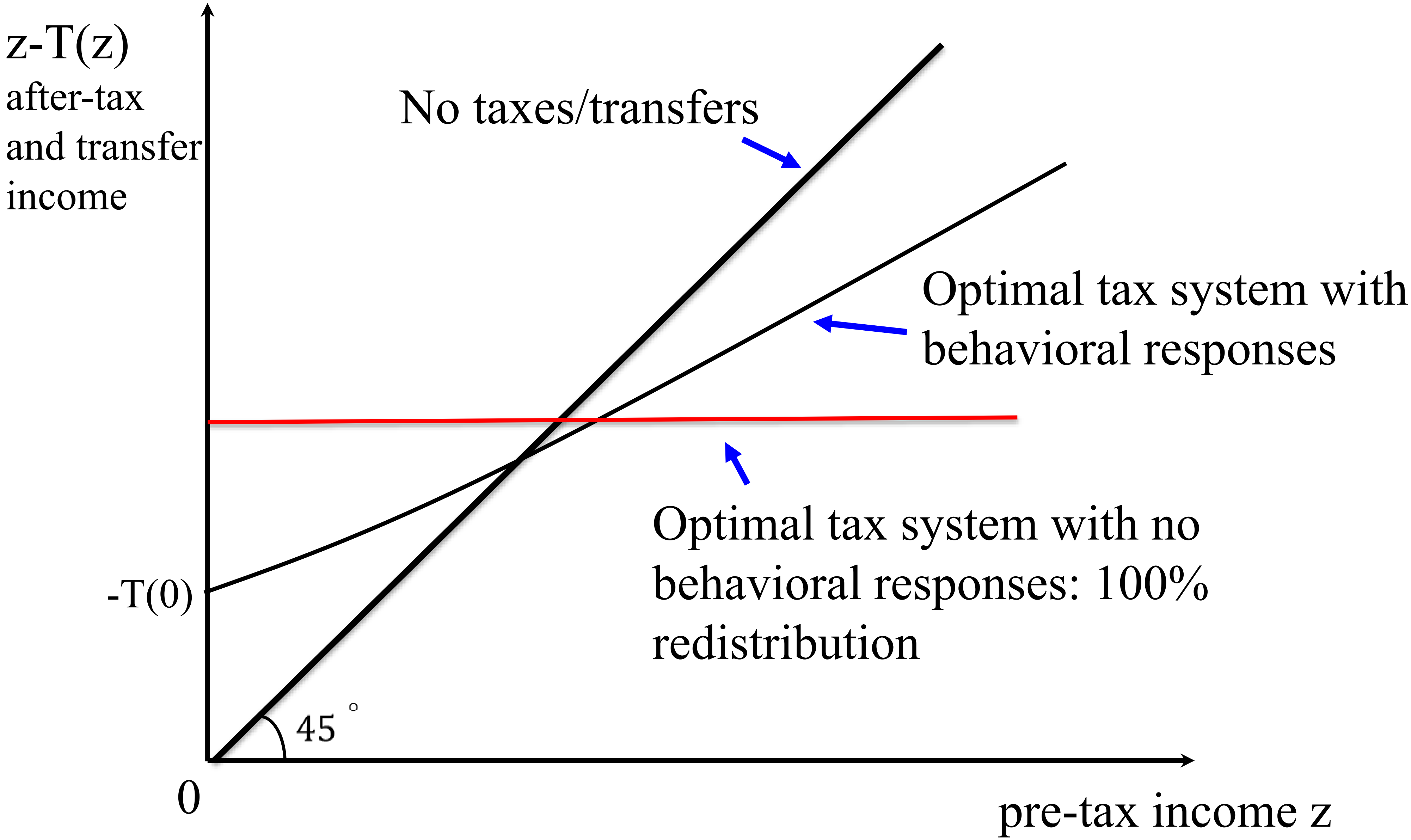
2) **Issue with Utilitarianism:** Even absent behavioral responses, many people would object to 100% redistribution

$\Rightarrow$ People's views on fairness impose **bounds** on redistribution

Stantcheva QJE'21 surveys: fairness more important than efficiency for views about tax policy in general public

We will discuss at the end of the lecture alternatives to utilitarianism (and be agnostic for now on how society's preferences for redistribution are shaped)

Optimal Tax/Transfer Systems



MIRRLEES OPTIMAL INCOME TAX MODEL (skip)

1) Standard labor supply model: Individual maximizes $u(c, l)$ subject to $c = wl - T(wl)$ where c consumption, l labor supply, w wage rate, $T(.)$ nonlinear income tax $\Rightarrow$ taxes affect labor supply

2) Individuals differ in ability w: w distributed with density $f(w)$.

3) Govt social welfare maximization: Govt maximizes

$$SWF = \int G(u(c, l))f(w)dw$$

($G(.)$ $\uparrow$ concave) subject to

(a) budget constraint $\int T(wl)f(w)dw \geq E$ (multiplier λ)

(b) individuals' labor supply l depends on $T(.)$

MIRRLEES MODEL RESULTS (skip)

Optimal income tax trades-off redistribution and efficiency (as tax based on w only not feasible)

$\Rightarrow T(.) < 0$ at bottom (transfer) and $T(.) > 0$ further up (tax) [full integration of taxes/transfers]

Mirrlees formulas complex, only a couple fairly general results:

1) $0 \leq T'(.) \leq 1$, $T'(.) \geq 0$ is non-trivial (rules out EITC) [Seade '77]

2) Marginal tax rate $T'(.)$ should be zero at the top (if skill distribution bounded) [Sadka '76-Seade '77]

3) If everybody works and lowest $wl > 0$, $T'(.) = 0$ at bottom

BEYOND MIRRLEES (skip)

Mirrlees '71 had a huge impact on information economics: models with asymmetric information in contract theory

Discrete 2-type version of Mirrlees model developed by Stiglitz JpubE '82 with individual FOC replaced by Incentive Compatibility constraint [high type should not mimick low type]

Till late 1990s, Mirrlees results not closely connected to empirical tax studies and little impact on tax policy recommendations

Since late 1990s, Diamond AER'98, Piketty '97, Saez ReStud '01 have connected Mirrlees model to practical tax policy / empirical tax studies

[new approach summarized in Diamond-Saez JEP'11 and Piketty-Saez Handbook'13]

INTENSIVE LABOR SUPPLY CONCEPTS

$$\max_{c,z} u(\underset{+}{c}, \underset{-}{z}) \text{ subject to } c = z \cdot (1-\tau) + R$$

R is virtual income and τ marginal tax rate. FOC in $c, z \Rightarrow$ $(1-\tau)u_c + u_z = 0 \Rightarrow$ Marshallian labor supply $z = z(1-\tau, R)$

$$\text{Uncompensated elasticity} \quad \varepsilon^u = \frac{(1-\tau)}{z}\frac{\partial z}{\partial(1-\tau)}$$

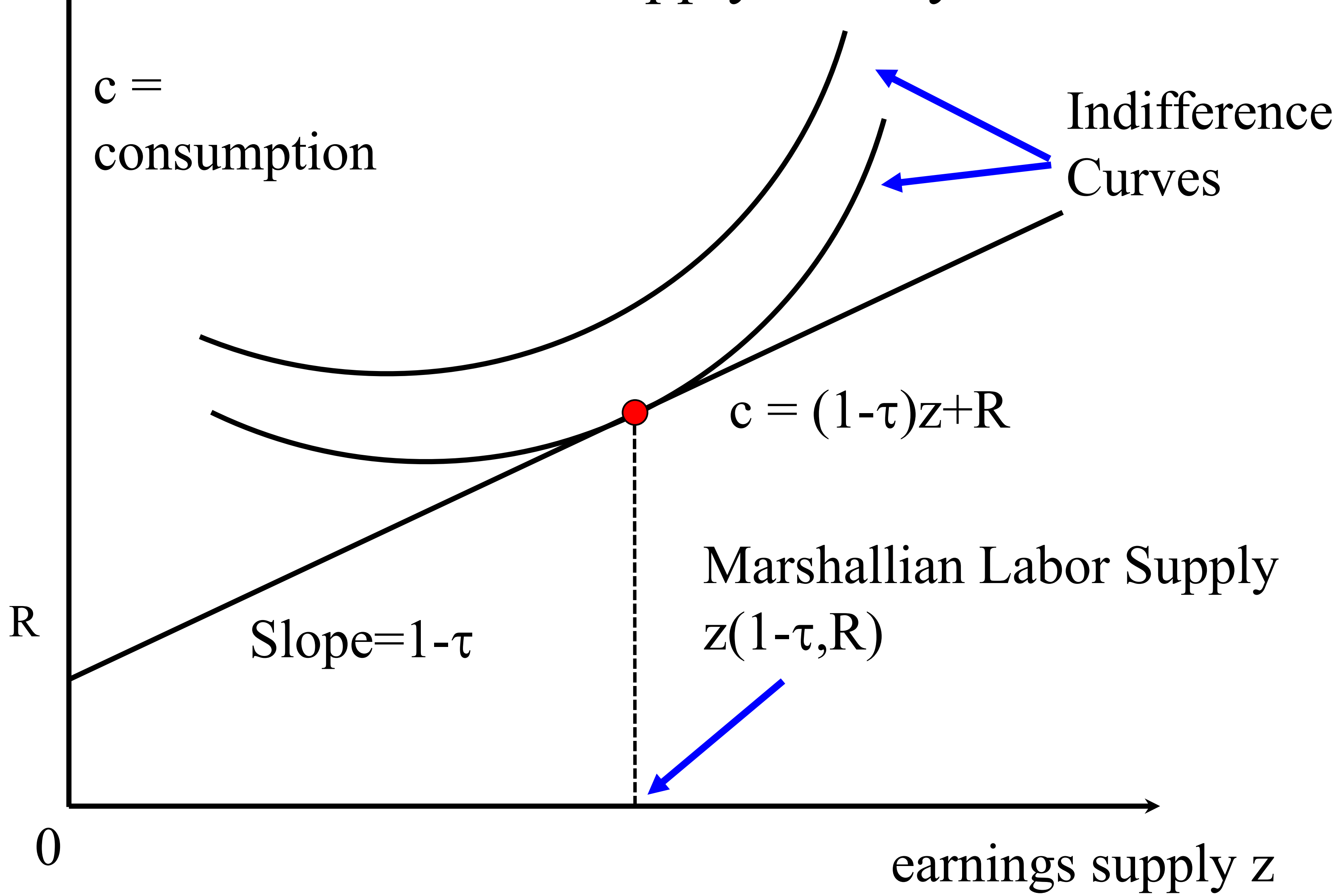
$$\text{Income effects} \quad \eta = (1-\tau)\frac{\partial z}{\partial R} \leq 0$$

Substitution effects: Hicksian labor supply: $z^c(1-\tau, u)$ minimizes cost needed to reach u given slope $1-\tau \Rightarrow$

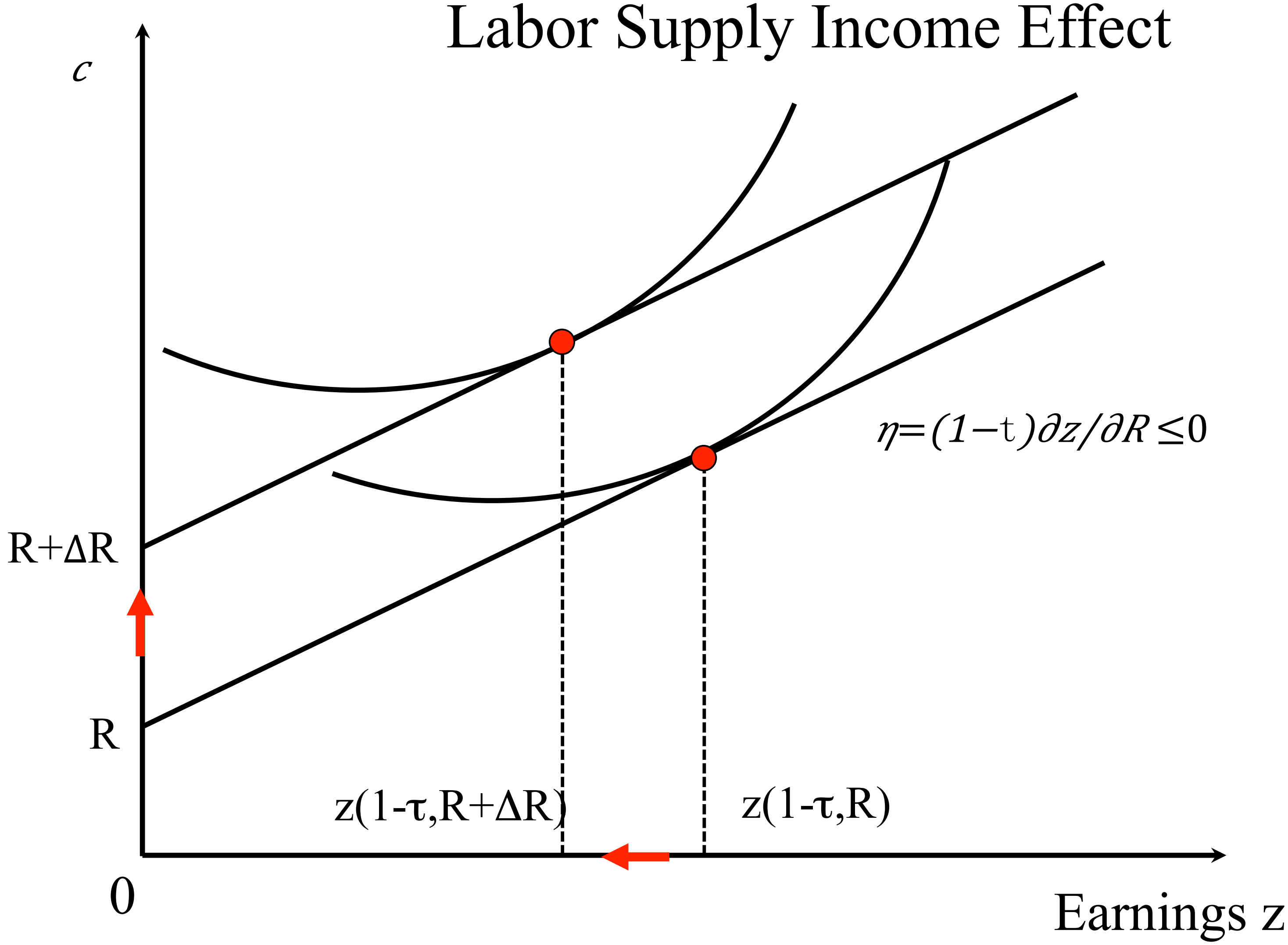
$$\text{Compensated elasticity} \quad \varepsilon^c = \frac{(1-\tau)}{z}\frac{\partial z^c}{\partial(1-\tau)} > 0$$

$$\text{Slutsky equation} \quad \frac{\partial z}{\partial(1-\tau)} = \frac{\partial z^c}{\partial(1-\tau)} + z\frac{\partial z}{\partial R} \Rightarrow \varepsilon^u = \varepsilon^c + \eta$$

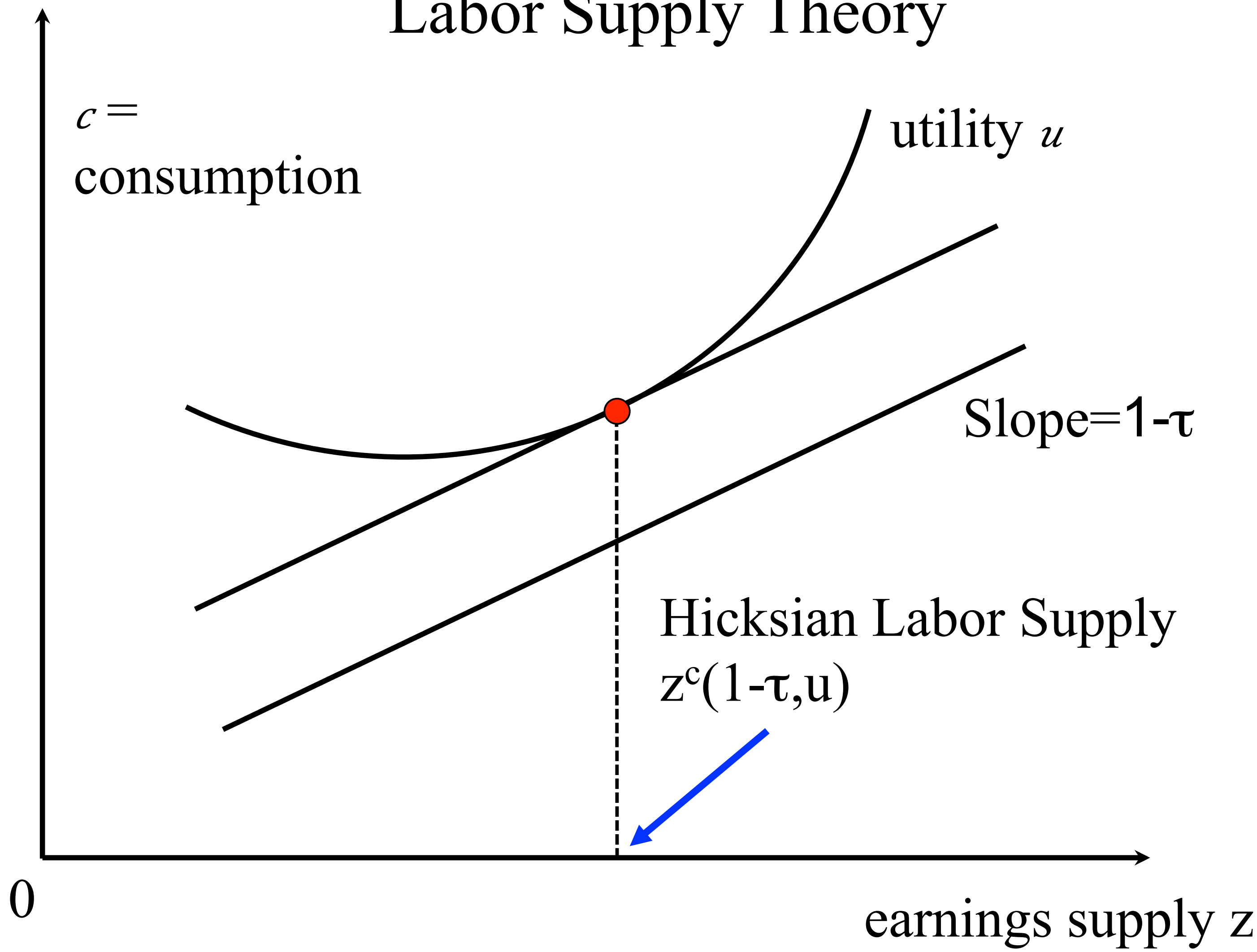
Labor Supply Theory



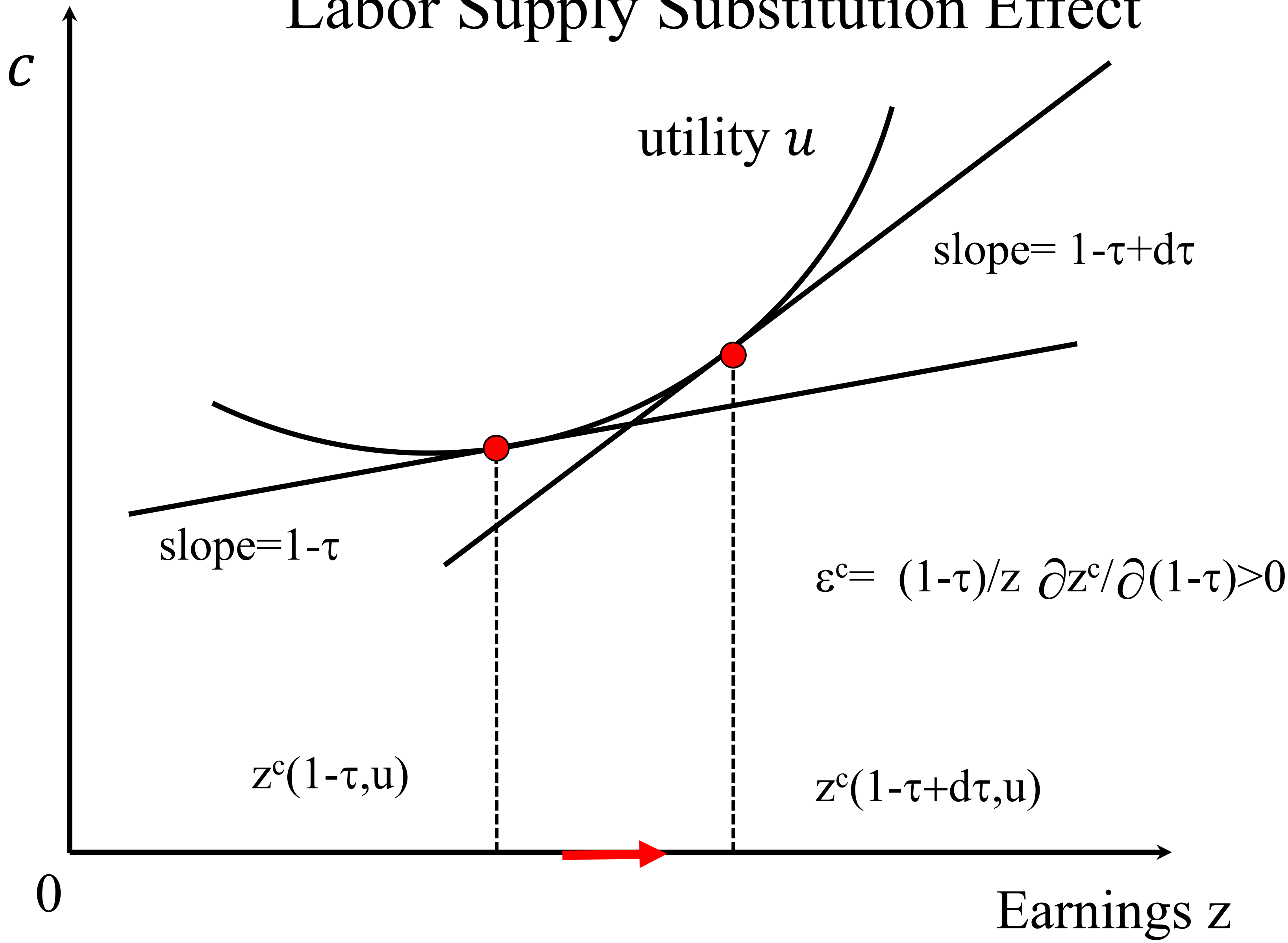
Labor Supply Income Effect



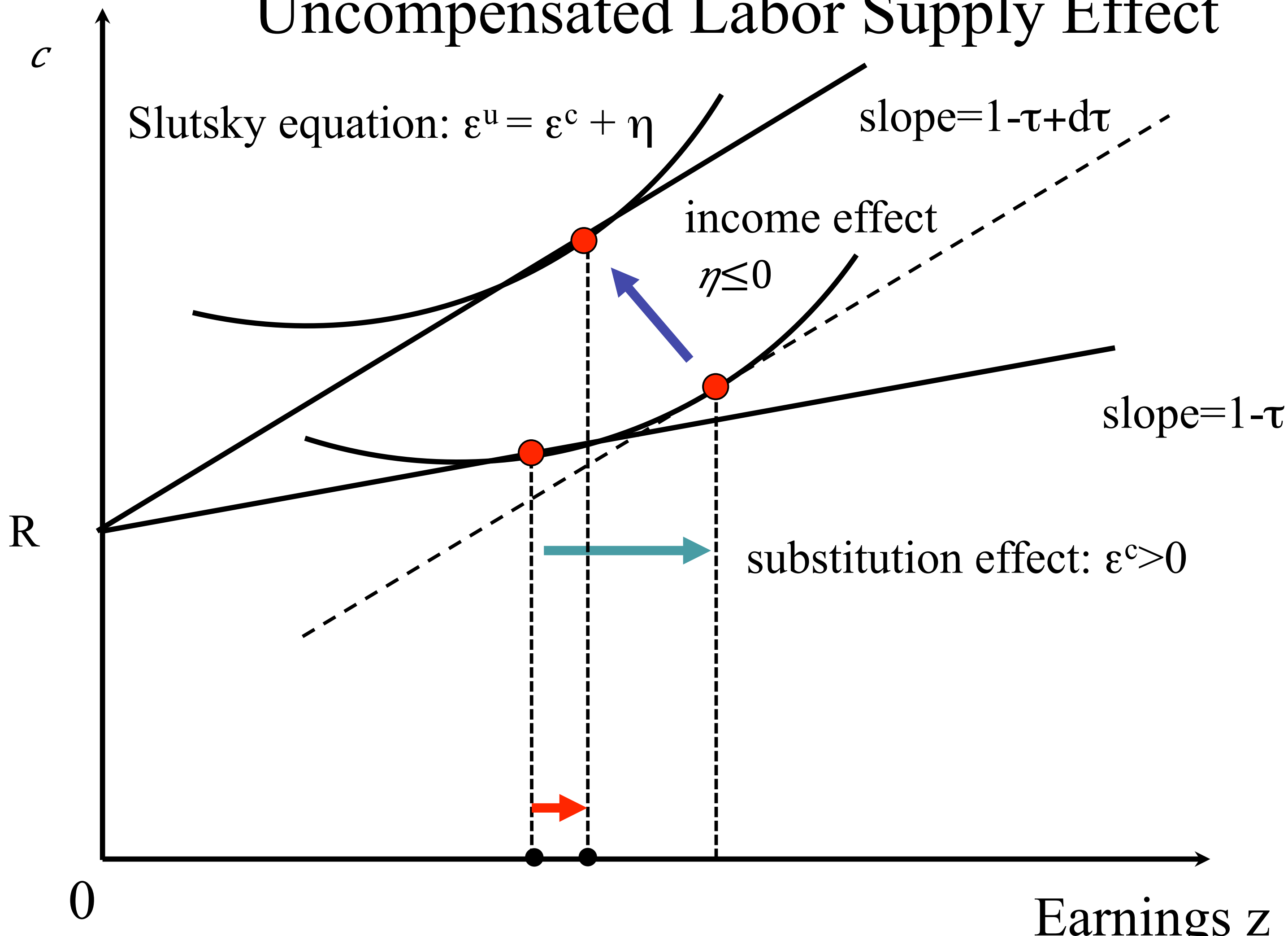
Labor Supply Theory



Labor Supply Substitution Effect



Uncompensated Labor Supply Effect



Example with no income effects and constant elasticity

$$\text{Quasi-linear utility: } u(c,z) = c - \frac{z^{1+1/\varepsilon}}{1+1/\varepsilon}$$

$$\max_z z \cdot (1-\tau) + R - \frac{z^{1+1/\varepsilon}}{1+1/\varepsilon}$$

$$\Rightarrow 1-\tau = z^{1/\varepsilon} \quad \Rightarrow z(1-\tau, R) = (1-\tau)^{\varepsilon}$$

$$\Rightarrow \eta = 0, \quad \varepsilon^u = \varepsilon^c = \varepsilon$$

No income effects and elasticity (compensated or uncompensated) is constant and equal to ε (= iso-elastic utility)

Case with no income effects simplifies labor supply theory and optimal tax derivation (Diamond AER'98)

Labor Supply Effects of Taxes and Transfers

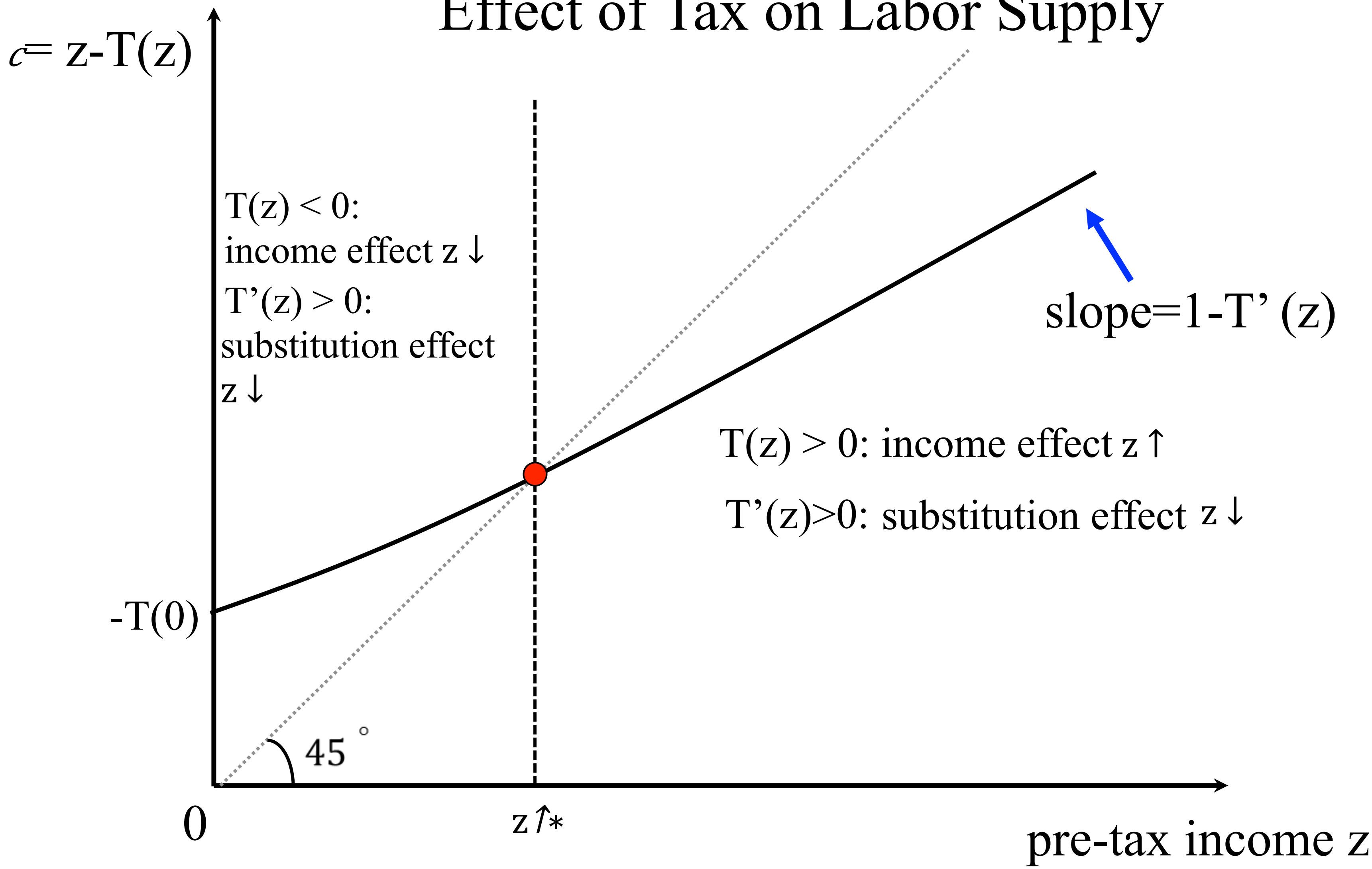
Taxes and transfers change the slope $1 - T'(z)$ of the budget constraint and net disposable income $z - T(z)$ (relative to the no tax situation where $c = z$)

Positive marginal tax rate ($T'(z) > 0$) reduces labor supply through substitution effects

Net transfer ($T(z) < 0$) reduces labor supply through income effects

Net tax ($T(z) > 0$) increases labor supply through income effects

Effect of Tax on Labor Supply



WELFARE EFFECT OF SMALL TAX REFORM

Indirect utility: $V(1-\tau, R) = \max_z u((1-\tau)z + R, z)$ where R is virtual income intercept

Small tax reform: $d\tau$ and dR:

$dV = u_c \cdot [-zd\tau + dR] + dz \cdot [(1-\tau)u_c + u_z] = u_c \cdot [-zd\tau + dR]$

Envelope theorem: no effect of dz on V because z is already chosen to maximize utility ($(1-\tau)u_c + u_z = 0$)

$[-zd\tau + dR]$ is the **mechanical** change in disposable income due to tax reform

Welfare impact of a small tax reform is given by u_c times the money metric **mechanical** change in tax

Remains true for any nonlinear tax system $T(z)$ (just need to look at $dT(z)$, mechanical change in taxes)

SOCIAL WELFARE FUNCTIONS (SWF)

Welfarism = social welfare based solely on individual utilities

Any other social objective will lead to Pareto dominated outcomes in some circumstances (Kaplow and Shavell JPE'01)

Most widely used welfarist SWF:

1) Utilitarian: $SWF = \int_i u^i$

2) Rawlsian (also called Maxi-Min): $SWF = \min_i u^i$

3) $SWF = \int_i G(u^i)$ with $G(.) \uparrow$ and concave, e.g., $G(u) = u^{1-\gamma}/(1-\gamma)$ (Utilitarian is $\gamma = 0$, Rawlsian is $\gamma = \infty$)

4) General Pareto weights: $SWF = \int_i \mu_i \cdot u^i$ with $\mu_i \geq 0$ exogenously given

SOCIAL MARGINAL WELFARE WEIGHTS

Key sufficient statistics in optimal tax formulas are **Social Marginal Welfare Weights** for each individual:

Social Marginal Welfare Weight on individual i is $g_i = \mu_i u_c^i / \lambda$ (λ multiplier of govt budget constraint) measures \$ value for govt of giving \$1 extra to person i

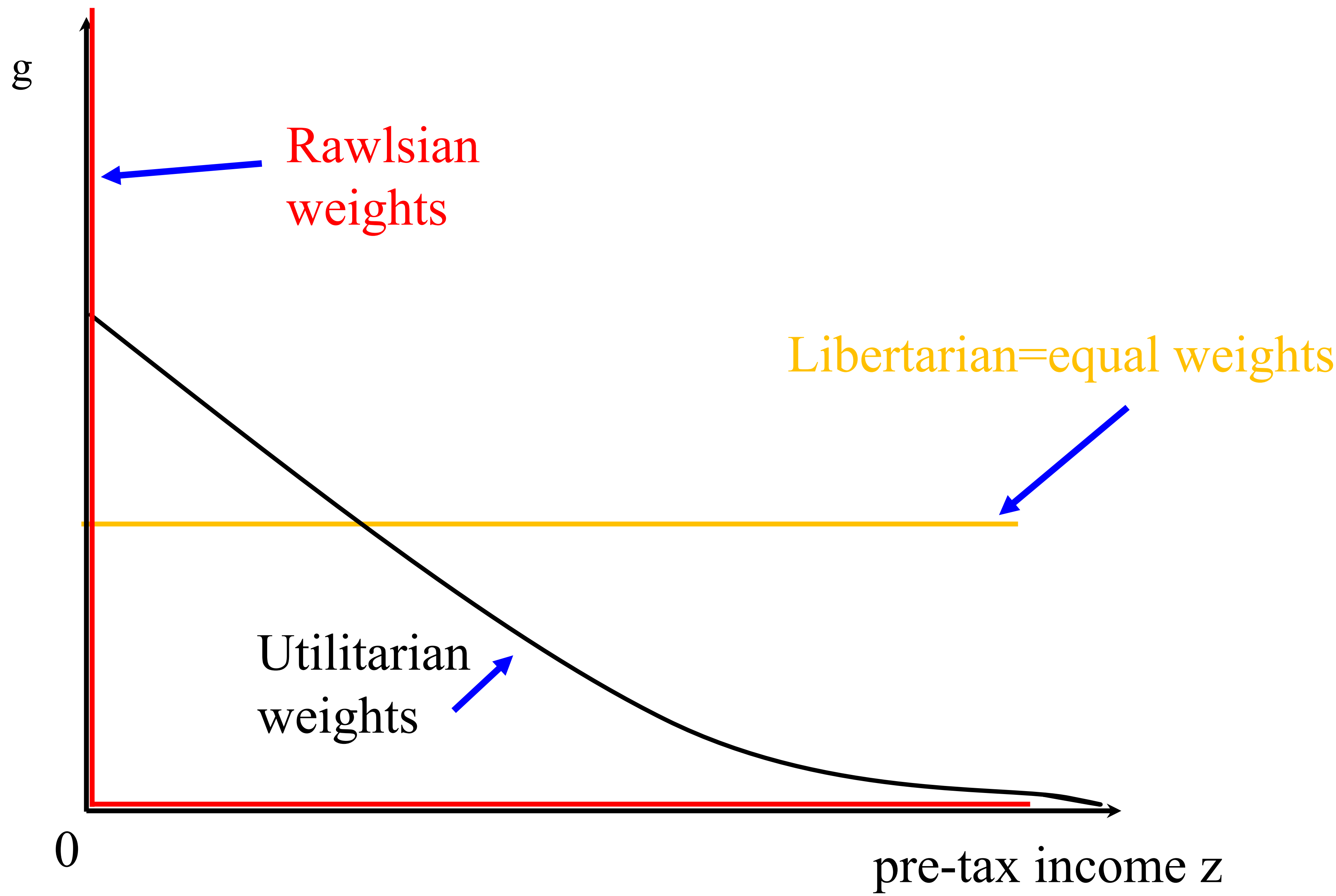
No income effects $\Rightarrow \int_i g_i = 1$: giving \$1 to all costs \$1 (pop. has measure 1) and increases SWF (in \$ terms) by $\int_i g_i$

g_i typically depend on tax system (endogenous variable)

Utilitarian case: g_i decreases with z_i due to decreasing marginal utility of consumption

Rawlsian case: g_i concentrated on most disadvantaged (typically those with $z_i = 0$)

Social Marginal Welfare Weights



OPTIMAL LINEAR TAX RATE: LAFFER CURVE (skip)

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

Population of size one (continuum) with heterogeneous preferences $u^i(c,z)$ [differences in earnings ability are built in utility function]

Individual i chooses z to maximize $u^i((1-\tau)\cdot z + R, z)$ labor supply choices $z^i(1-\tau, R)$ aggregate to economy wide earnings $Z(1-\tau) = \int_i z^i$

Tax Revenue $R(\tau) = \tau \cdot Z(1-\tau)$ is inversely U-shaped with τ: $R(\tau = 0) = 0$ (no taxes) and $R(\tau = 1) = 0$ (nobody works): called the Laffer Curve

OPTIMAL LINEAR TAX RATE: LAFFER RATE (skip)

Top of the Laffer Curve corresponds to tax rate τ^* maximizing tax revenue: inefficient to have $\tau > \tau^*$

$$R'(\tau^*) = Z - \tau^* dZ/d(1-\tau) = 0 \Rightarrow$$

Revenue maximizing tax rate (Laffer rate):

$$\tau^* = \frac{1}{1+e} \quad \text{with} \quad e = \frac{1-\tau}{Z} \frac{dZ}{d(1-\tau)}$$

elasticity of earnings with respect to the net-of-tax rate

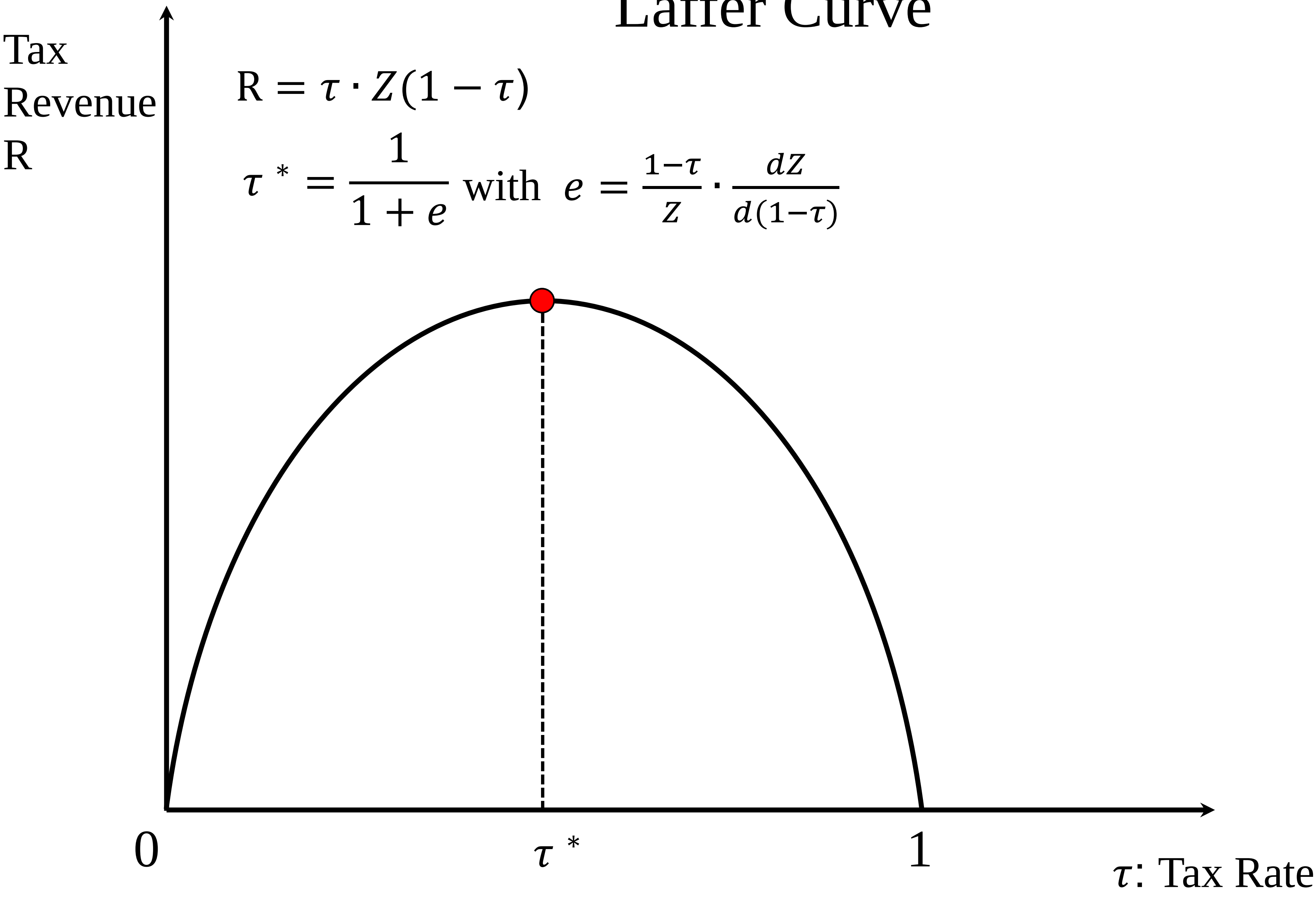
$\tau > \tau^*$ is (second-best) Pareto inefficient: cutting τ increases individuals welfare and government revenue (and hence R)

$\tau = \tau^*$ is the optimum in Rawlsian case (if some people have zero earnings)

Laffer Curve

$$R = \tau \cdot Z(1-\tau)$$

$$\tau^* = \frac{1}{1+e} \text{ with } e = \frac{1-\tau}{Z} \cdot \frac{dZ}{d(1-\tau)}$$



OPTIMAL LINEAR TAX RATE: FORMULA (skip)

Government chooses τ to maximize

$$\int_i G[u^i((1-\tau)z^i + \tau Z(1-\tau), z^i)]$$

Govt FOC (using the envelope theorem as z^i maximizes u^i):

$$0 = \int_i G'(u^i)u^i_c \cdot \left[-z^i + Z - \tau \frac{dZ}{d(1-\tau)} \right],$$

$$0 = \int_i G'(u^i)u^i_c \cdot \left[(Z - z^i) - \frac{\tau}{1-\tau} eZ \right],$$

First term $(Z - z^i)$ is mechanical redistributive effect of $d\tau$, second term is efficiency cost due to behavioral response of Z

$\Rightarrow$ we obtain the following optimal linear income tax formula

$$\tau = \frac{1-\bar{g}}{1-\bar{g}+e} \quad \text{with} \quad \bar{g} = \frac{\int g_i \cdot z_i}{Z \cdot \int g_i}, \quad g_i = G'(u^i)u^i_c$$

OPTIMAL LINEAR TAX RATE: FORMULA (skip)

$$\tau = \frac{1-\bar{g}}{1-\bar{g}+e} \quad \text{with} \quad \bar{g} = \frac{\int g_i \cdot z_i}{Z \cdot \int g_i}, \quad g_i = G'(u^i)u_c^i$$

$0 \leq \bar{g} < 1$ if g_i is decreasing with z_i (social marginal welfare weights fall with z_i).

$\bar{g}$ low when (a) inequality is high, (b) $g^i \downarrow$ sharply with z^i

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

Rawlsian case: $g_i \equiv 0$ for all $z_i > 0$ so $\bar{g} = 0$ and $\tau = 1/(1+e)$

OPTIMAL TOP INCOME TAX RATE (SAEZ '01)

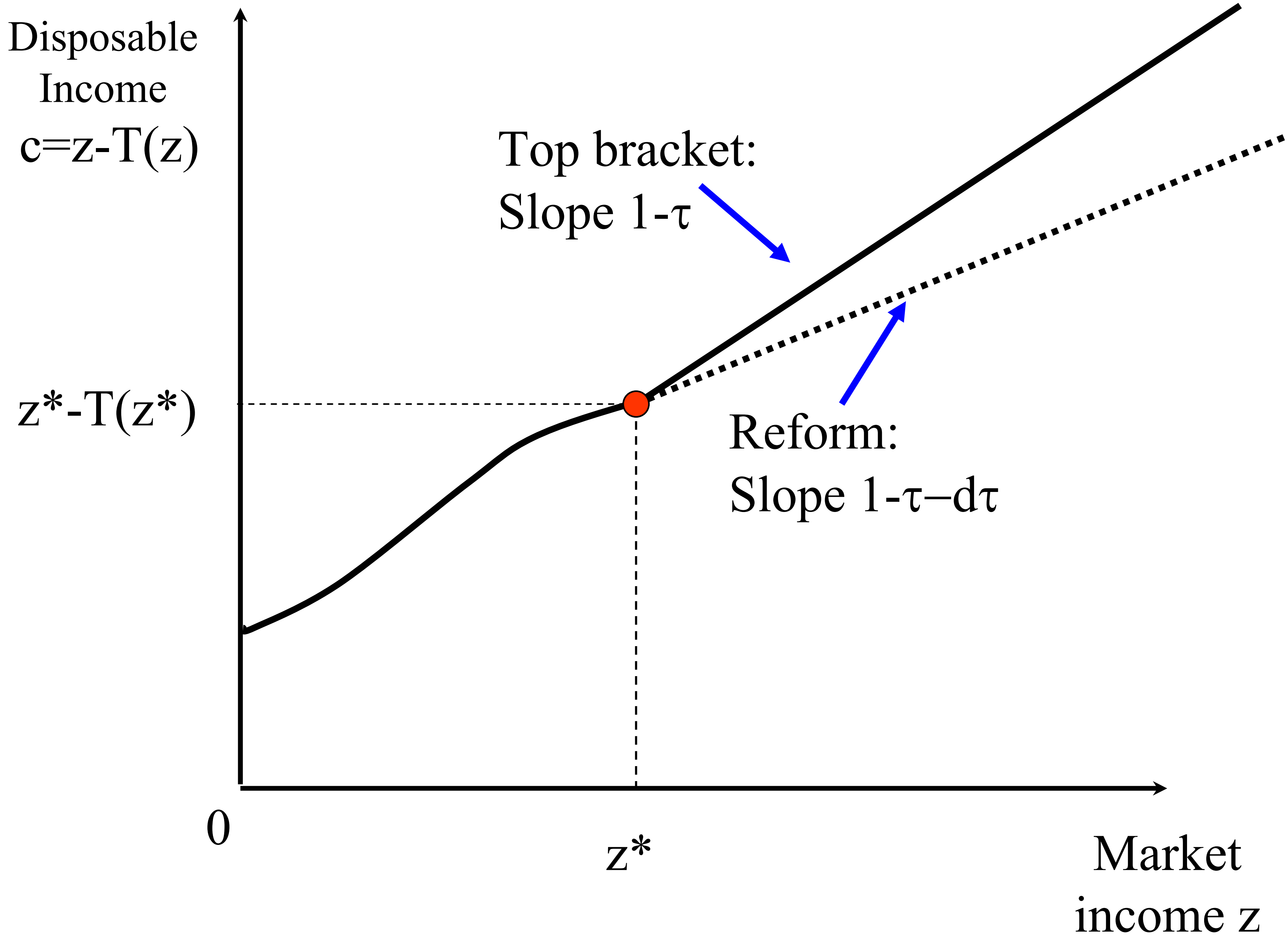
Consider constant MTR τ above fixed z^*. Goal is to derive optimal τ

Assume (without loss of generality) there is a continuum of measure one of individuals above z^*

Let $z(1-\tau)$ be their average income [depends on net-of-tax rate $1-\tau$], with elasticity $e = [(1-\tau)/z] \cdot dz/d(1-\tau)$

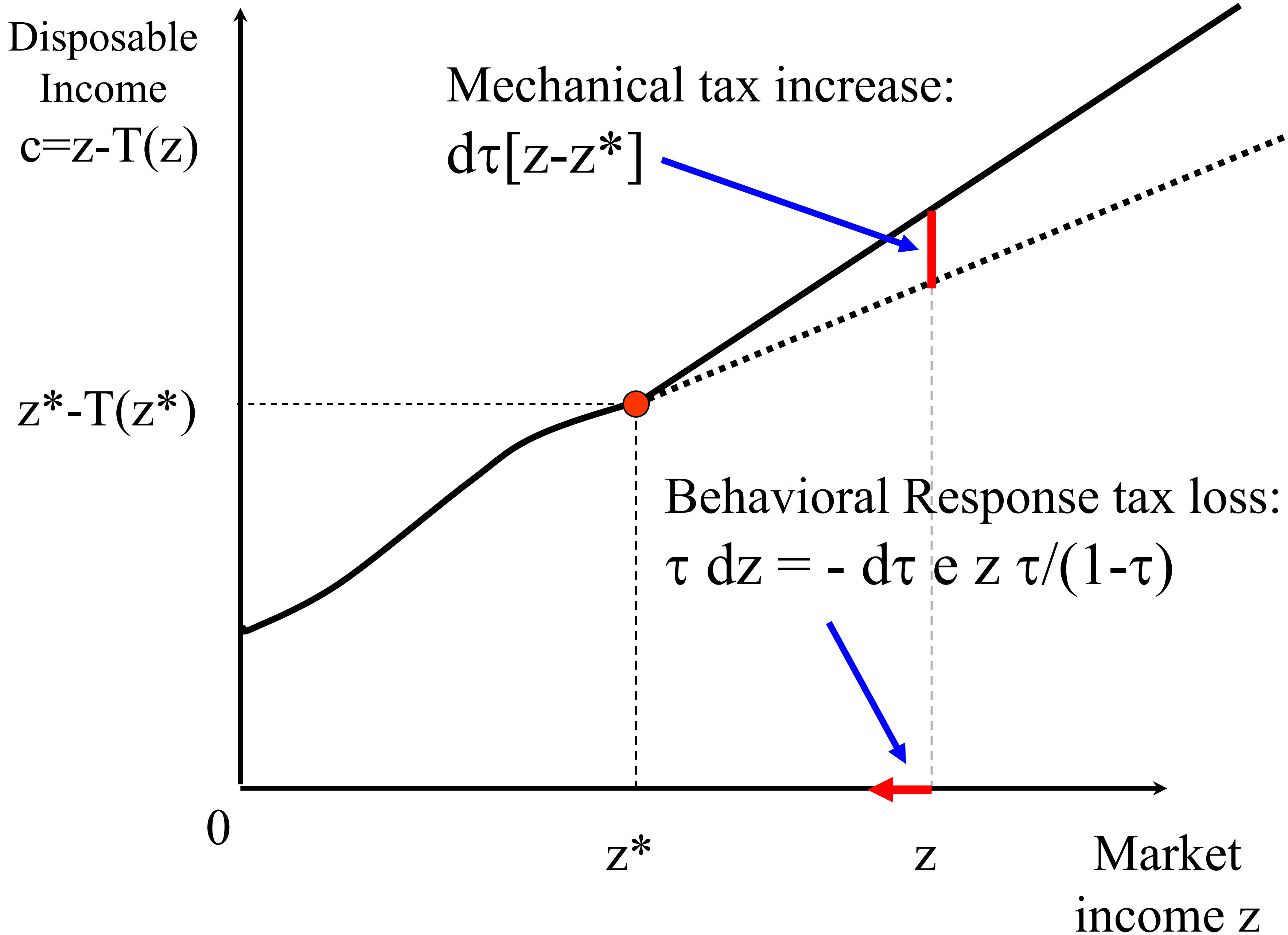
Note that e is a mix of income and substitution effects (see Saez '01 and Diamond-Saez '11 for simple exposition)

Optimal Top Income Tax Rate (Mirrlees '71 model)



Source: Diamond and Saez JEP'11

Optimal Top Income Tax Rate (Mirrlees '71 model)



Source: Diamond and Saez JEP'11

OPTIMAL TOP INCOME TAX RATE

Consider small $d\tau > 0$ reform above z^*.

1) **Mechanical increase** in tax revenue:

$$dM = [z - z^*]d\tau$$

2) **Welfare effect:**

$$dW = -\bar{g} \cdot dM = -\bar{g} \cdot [z - z^*]d\tau$$

where $\bar{g}$ is the social marginal welfare weight for top earners

3) **Behavioral response** reduces tax revenue:

$$dB = \tau \cdot dz = -\tau \frac{dz}{d(1-\tau)} d\tau = -\frac{\tau}{1-\tau} \cdot \frac{1-\tau}{z} \frac{dz}{d(1-\tau)} \cdot z d\tau$$

$$\Rightarrow dB = -\frac{\tau}{1-\tau} \cdot e \cdot z d\tau$$

OPTIMAL TOP INCOME TAX RATE

$$dM + dW + dB = d\tau \cdot \left[(1-\bar{g})[z - z^*] - e\frac{\tau}{1-\tau} z \right]$$

Optimal τ such that $dM + dW + dB = 0 \Rightarrow$

$$\frac{\tau}{1-\tau} = \frac{(1-\bar{g})[z - z^*]}{e \cdot z}$$

$$\tau = \frac{1-\bar{g}}{1-\bar{g}+a \cdot e} \quad \text{with} \quad a = \frac{z}{z - z^*}$$

Optimal $\tau \downarrow \bar{g}$ [redistributive views]

Optimal $\tau \downarrow$ with e [efficiency]

Optimal $\tau \downarrow a$ [thinness of top tail]

ZERO TOP RATE RESULT (skip)

Suppose top earner earns z^T

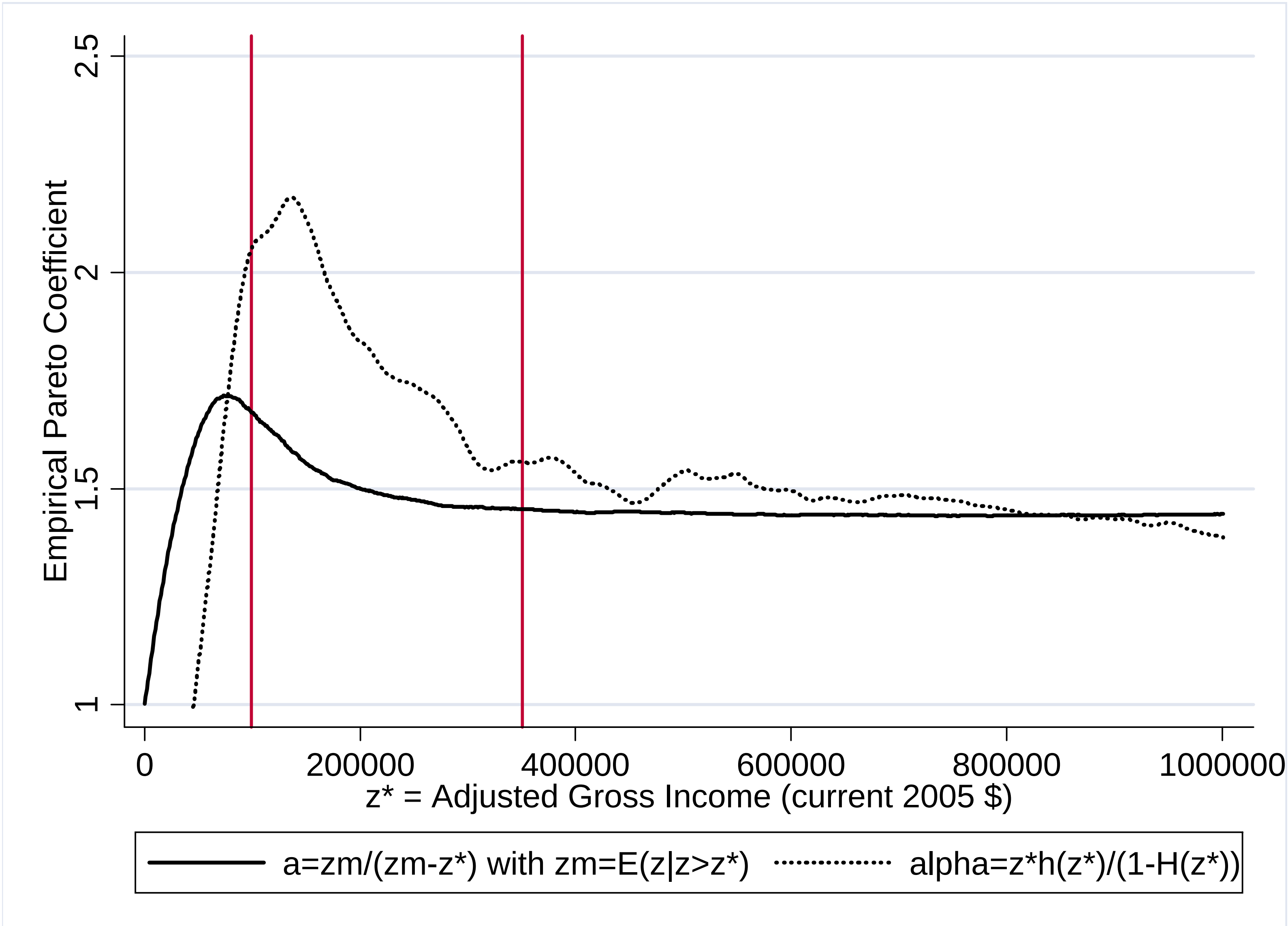
When $z^* \to z^T \Rightarrow z \to z^T$

$$dM = d\tau[z - z^*] << dB = d\tau \cdot e \cdot \frac{\tau}{1-\tau} z \quad \text{when} \quad z^* \to z^T$$

Intuition: extra tax applies only to earnings above z^* but behavioral response applies to full $z \Rightarrow$

Optimal τ should be zero when z^* close to z^T (Sadka-Seade zero top rate result) but result applies only to top earner

Top is uncertain: If actual distribution is finite draw from an underlying Pareto distribution then expected revenue maximizing rate is $1/(1 + a \cdot e)$ (Diamond and Saez JEP'11)



Source: Diamond and Saez JEP'11

OPTIMAL TOP INCOME TAX RATE

Empirically: $a = z/(z - z^*)$ very stable above $z^* = \$400K$

Pareto distribution $1 - F(z) = (k/z)^\alpha$, $f(z) = \alpha \cdot k^\alpha / z^{1+\alpha}$, with α Pareto parameter

$$z(z^*) = \frac{\int_{z^*}^{\infty} s f(s) ds}{\int_{z^*}^{\infty} f(s) ds} = \frac{\int_{z^*}^{\infty} s^{-\alpha} ds}{\int_{z^*}^{\infty} s^{-\alpha-1} ds} = \frac{\alpha}{\alpha - 1} \cdot z^*$$

$\alpha = z/(z - z^*) = a$ measures *thinness* of top tail of the distribution

Empirically $a \in (1.5, 3)$, US has $a = 1.5$, Denmark has $a = 3$

$$\tau = \frac{1 - \bar{g}}{1 - \bar{g} + a \cdot e}$$

Only difficult parameter to estimate is e

TAX REVENUE MAXIMIZING TAX RATE

Utilitarian criterion with $u_c \to 0$ when $c \to \infty \Rightarrow \bar{g} \to 0$ when $z^* \to \infty$

Rawlsian criterion (maximize utility of worst off person) $\Rightarrow$ $\bar{g} = 0$ for any $z^* > \min(z)$

In the end, $\bar{g}$ reflects the value that society puts on marginal consumption of the rich

$\bar{g} = 0 \Rightarrow$ Tax Revenue Maximizing Rate $\tau = 1/(1 + a \cdot e)$ (upper bound on top tax rate)

Example: $a = 2$ and $e = 0.25 \Rightarrow \tau = 2/3 = 66.7\%$

Laffer linear rate is a special case with $z^* = 0$, $z^m/z^* = \infty = a/(a-1)$ and hence $a = 1$, $\tau = 1/(1+e)$

EXTENSION: MIGRATION EFFECTS (skip)

Migration issues may be particularly important at the top end (brain drain). Some theory papers (Mirrlees '82, Lehmann-Simula QJE'14).

Migration depends on average tax rate. Define $P(z-T(z)|z)$ fraction of z earners in the country: Elasticity

$$\eta^m = \frac{z-T(z)}{P} \cdot \frac{\partial P}{\partial(z-T(z))}$$

Tax revenue maximizing formula (Brewer-Saez-Shepard '10):

$$\tau = \frac{1}{1+a\cdot e+\bar{\eta}^m}$$

Note: $\bar{\eta}^m$ depends on size of jurisdiction: large for cities, zero worldwide $\Rightarrow$ (1) Redistribution easier in large jurisdictions, (2) Tax coordination across countries increases ability to redistribute (big issue currently in EU)

REAL VS. TAX AVOIDANCE RESPONSES (skip)

Behavioral response to income tax comes not only from reduced labor supply but also shifts to other forms of income or activities: (untaxed fringe benefits, deferred compensation, shift to corporate income tax base, shift toward tax favored capital gains, etc.)

Real responses vs. tax avoidance responses is critical for 2 reasons:

1) Govt can control tax avoidance through other tools: closing loopholes, broadening the tax base $\Rightarrow$ Elasticity e is endogenous to tax system design (Slemrod)

2) Most tax avoidance responses create "fiscal externalities" in the sense that tax revenue increases at other time periods or in other tax bases (Saez-Slemrod-Giertz JEL' 12)

REAL VS. AVOIDANCE RESPONSES (skip)

Key policy question: Is it possible to eliminate avoidance elasticity using base broadening, etc.? or would new avoidance schemes keep popping up?

a) Some forms of tax avoidance are due to **poorly designed tax codes** (preferential treatment for some income forms, deductions)

b) Some forms of tax avoidance/evasion can only be addressed with **international cooperation** (off-shore tax evasion in tax heavens)

c) Some forms of tax avoidance/evasion are due to technological limitations of tax collection (impossible to tax informal cash businesses)

GENERAL NON-LINEAR INCOME TAX $T(z)$

(1) Lumpsum grant given to everybody equal to $-T(0)$

(2) Marginal tax rate schedule $T'(z)$ describing how (a) lumpsum grant is taxed away, (b) how tax liability increases with income

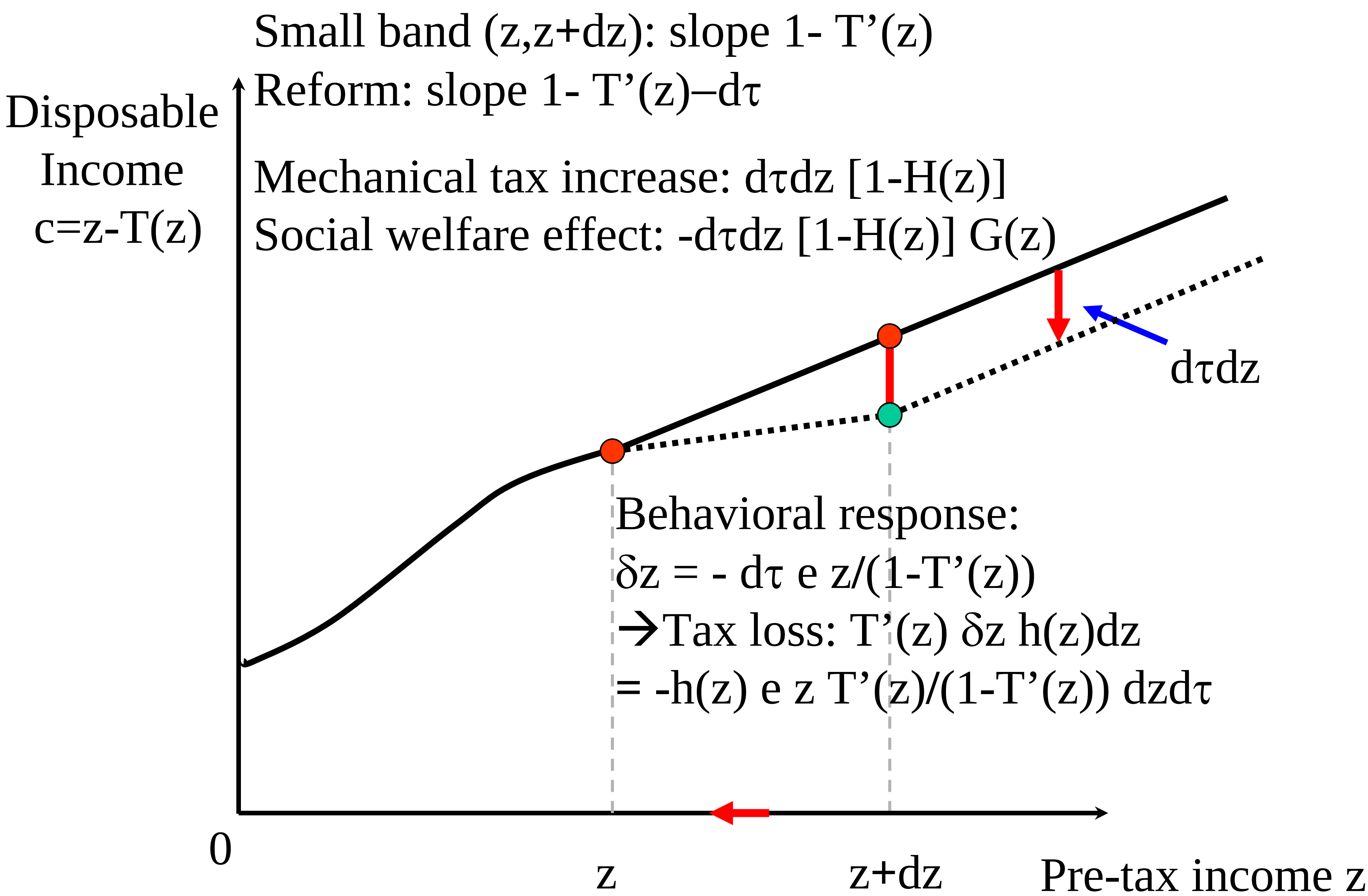
Let $H(z)$ be the income CDF [population normalized to 1] and $h(z)$ its density [endogenous to $T(.)$]

Let $g(z)$ be the social marginal value of consumption for taxpayers with income z in terms of public funds.

Assumption: no income effects $\Rightarrow \int g(z)h(z)dz = 1$

Redistribution valued $\Rightarrow g(z)$ decreases with z

$G(z)$ the average social marginal weight above z [$G(z) = \int_z^\infty g(s)h(s)ds/(1-H(z))$]



Source: Diamond and Saez JEP'11

GENERAL NON-LINEAR INCOME TAX (skip)

Assume away income effects $\varepsilon^c = \varepsilon^u = e$ [Diamond AER'98 shows this is the key theoretical simplification]

Consider small reform: increase T' by $d\tau$ in small band z and $z + dz$

Mechanical effect $dM = dzd\tau[1 - H(z)]$

Welfare effect $dW = -dzd\tau[1 - H(z)]G(z)$

Behavioral effect: substitution effect δz inside small band $[z, z+dz]$: $dB = h(z)dz \cdot T' \cdot \delta z = -h(z)dz \cdot T' \cdot d\tau \cdot z \cdot e_{(z)}/(1 - T')$

Optimum $dM + dW + dB = 0$

GENERAL NON-LINEAR INCOME TAX

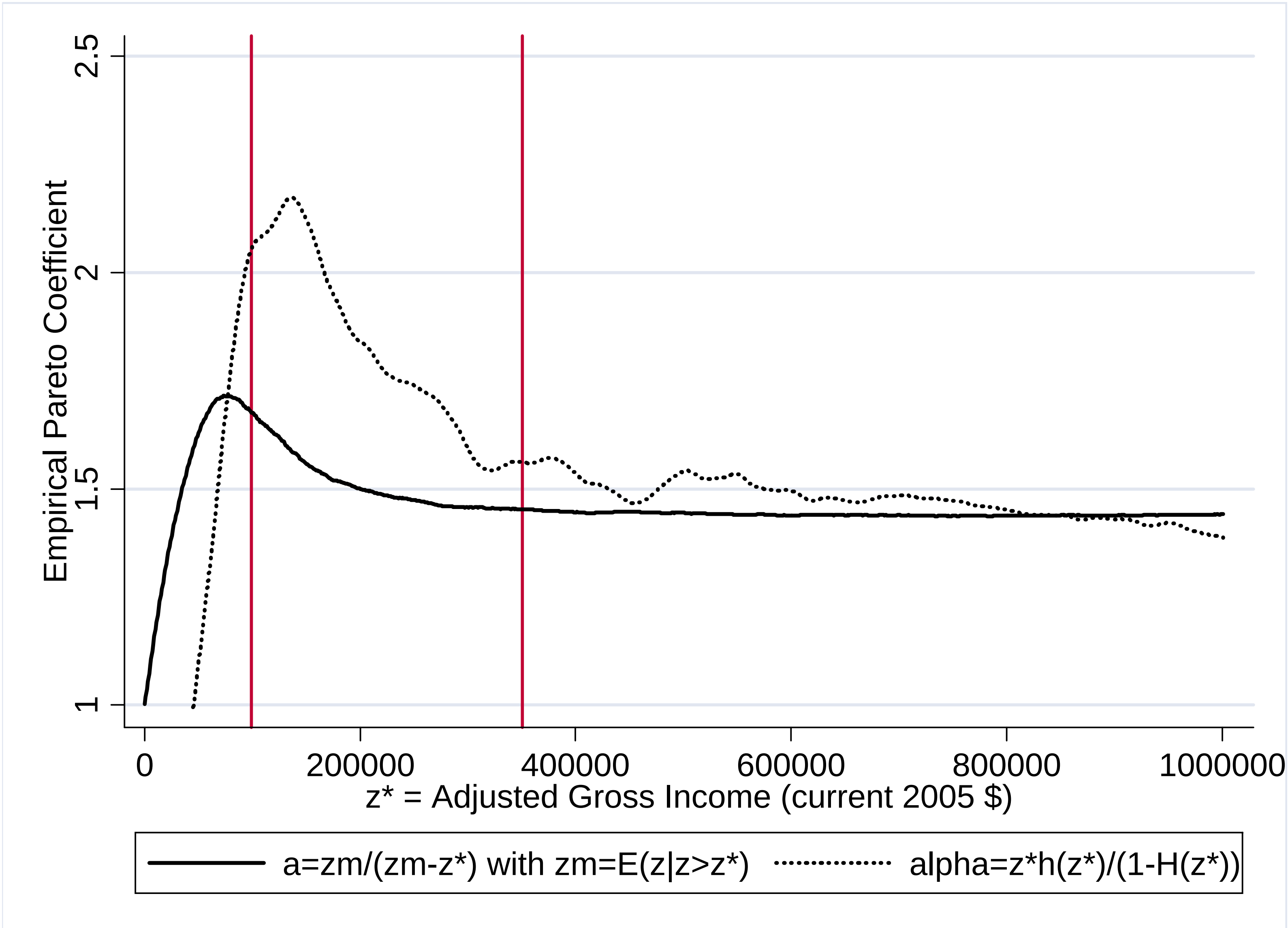
$$T'(z) = \frac{1 - G(z)}{1 - G(z) + \alpha(z) \cdot e_{(z)}}$$

1) $T'(z)$ decreases with $e_{(z)}$ (elasticity efficiency effects)

2) $T'(z)$ decreases with $\alpha(z) = (zh(z))/(1-H(z))$ (local Pareto parameter)

3) $T'(z)$ decreases with $G(z)$ (avg. social weight above z)

Asymptotics: $G(z) \to \bar{g}$, $\alpha(z) \to a$, $e_{(z)} \to e \Rightarrow$ Recover top rate formula $\tau = (1 - \bar{g})/(1 - \bar{g} + a \cdot e)$



Source: Diamond and Saez JEP'11

Negative Marginal Tax Rates Never Optimal (skip)

Suppose $T' < 0$ in band $[z, z + dz]$

Increase T' by $d\tau > 0$ in band $[z, z + dz]$: $dM + dW > 0$ and $dB > 0$ because $T'(z) < 0$

$\Rightarrow$ Desirable reform

$\Rightarrow$ $T'(z) < 0$ cannot be optimal

EITC schemes are not desirable in Mirrlees '71 model

NUMERICAL SIMULATIONS (skip)

$H(z)$ [and also $G(z)$] endogenous to $T(.)$. Calibration method (Saez Restud '01):

Specify utility function (e.g. constant elasticity and no income effects):

$$u(c, z) = c - \frac{1}{1 + \frac{1}{e}} \cdot \left(\frac{z}{n}\right)^{1+\frac{1}{e}}$$

Individual FOC $\Rightarrow z = n^{1+e}(1 - T')^e$

Calibrate the exogenous skill distribution $F(n)$ so that, using **actual** $T'(.)$, you recover **empirical** $H(z)$

Use Mirrlees '71 tax formula (expressed in terms of $F(n)$) to obtain the optimal tax rate schedule T'.

NUMERICAL SIMULATIONS (skip)

$$\frac{T'(z(n))}{1-T'(z(n))} = \left(1+\frac{1}{e}\right)\left(\frac{1}{nf(n)}\right)\int_n^\infty \left[1-\frac{G'(u(m))}{\lambda}\right] f(m)dm,$$

Iterative Fixed Point method: start with T'_0, compute $z^0(n)$ using individual FOC, get $T^0(0)$ using govt budget, compute $u^0(n)$, get λ using $\lambda = \int G'(u)f(m)dm$, use formula to estimate T'_1, iterate till convergence

Fast and effective method (Brewer-Saez-Shepard '10)

NUMERICAL SIMULATION RESULTS (skip)

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

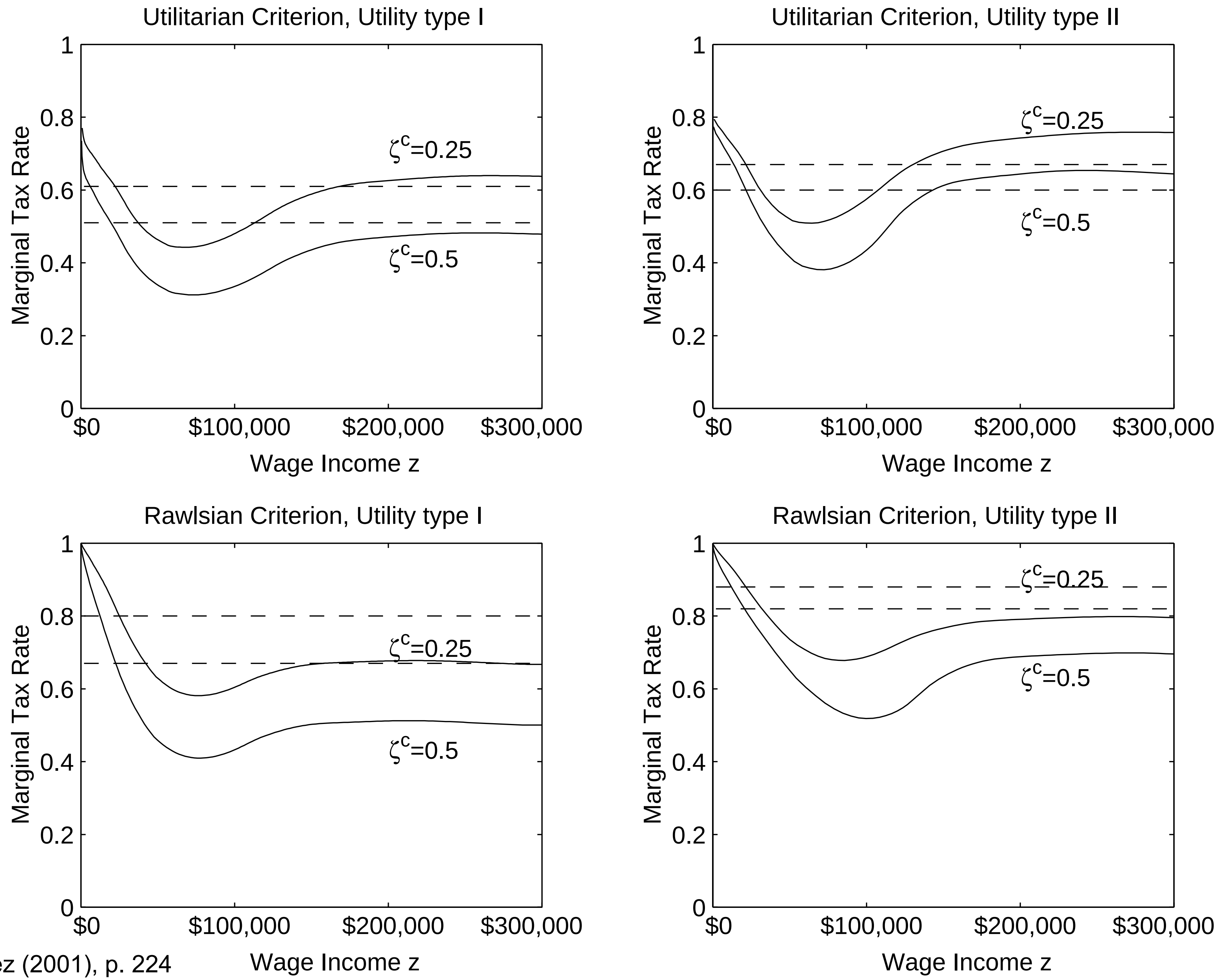
Take utility function with e constant

2) $\alpha(z) = (zh(z))/(1 - H(z))$ is inversely U-shaped empirically

3) $1 - G(z)$ increases with z from 0 to 1 ($\bar{g} = 0$)

$\Rightarrow$ Numerical optimal $T'(z)$ is U-shaped with z: reverse of the general results $T' = 0$ at top and bottom [Diamond AER'98 gives theoretical conditions to get U-shape]

FIGURE 5 − Optimal Tax Simulations



Source: Saez (2001), p. 224

OPTIMAL TRANSFERS: MIRRLEES MODEL

Mirrlees model predicts that optimal transfer at bottom takes the form of a "Negative Income Tax":

1) Lumpsum grant $-T(0)$ for those with no earnings

2) High MTRs $T'(z)$ at the bottom to phase-out the lumpsum grant quickly: intuition

Intuition: high MTRs at bottom are efficient because:

(a) they target transfers to the most needy

(b) earnings at the bottom are low to start with so intensive response does not generate large output losses

OPTIMAL TRANSFERS: MIRRLEES MODEL

Diamond-Saez JEP'11:

$$T'(0) = (g_0 - 1)/(g_0 - 1 + e_0)$$

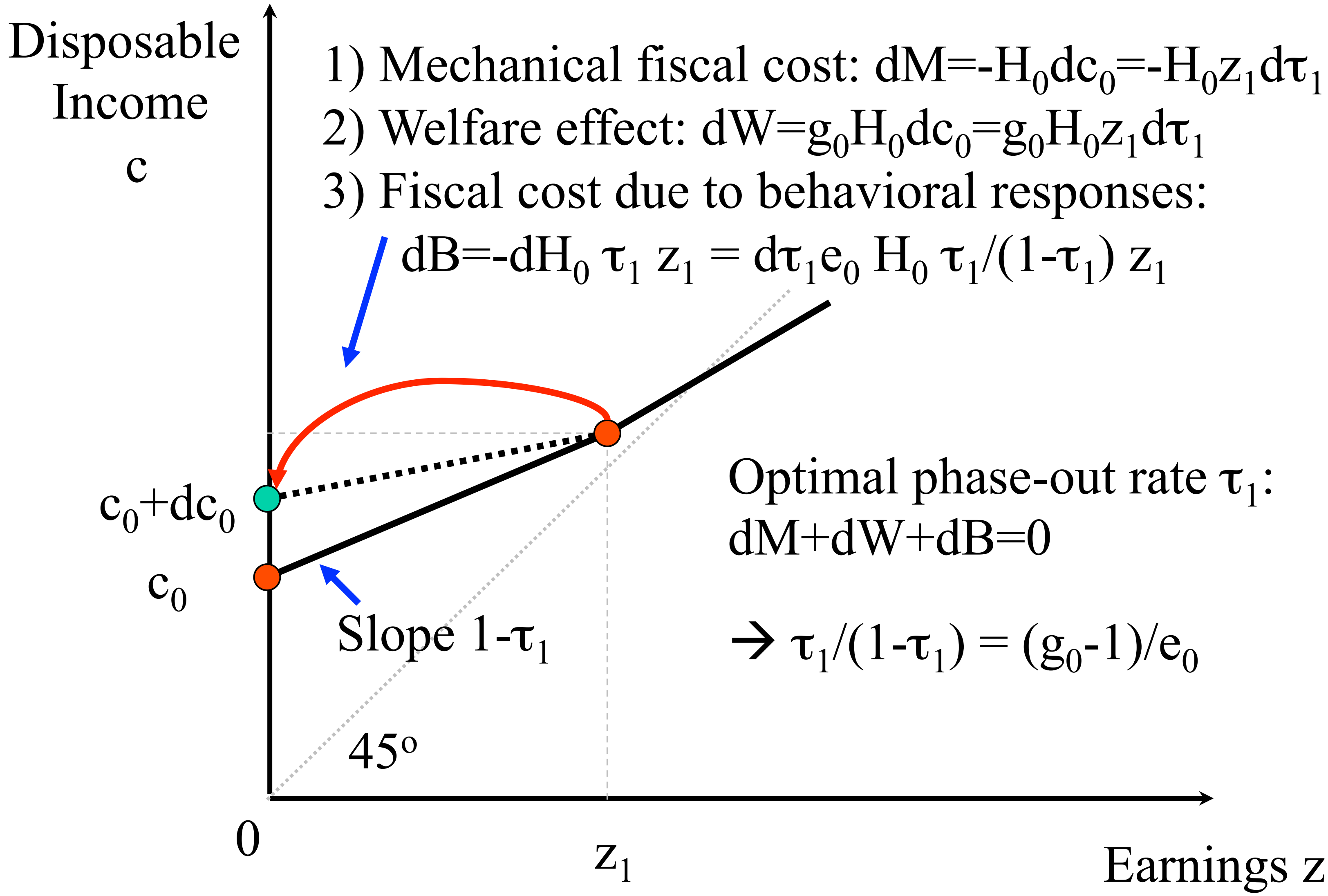
e_0 elasticity of the fraction non-working wrt to $1 - T'(0)$

g_0 social marginal welfare weight on non workers

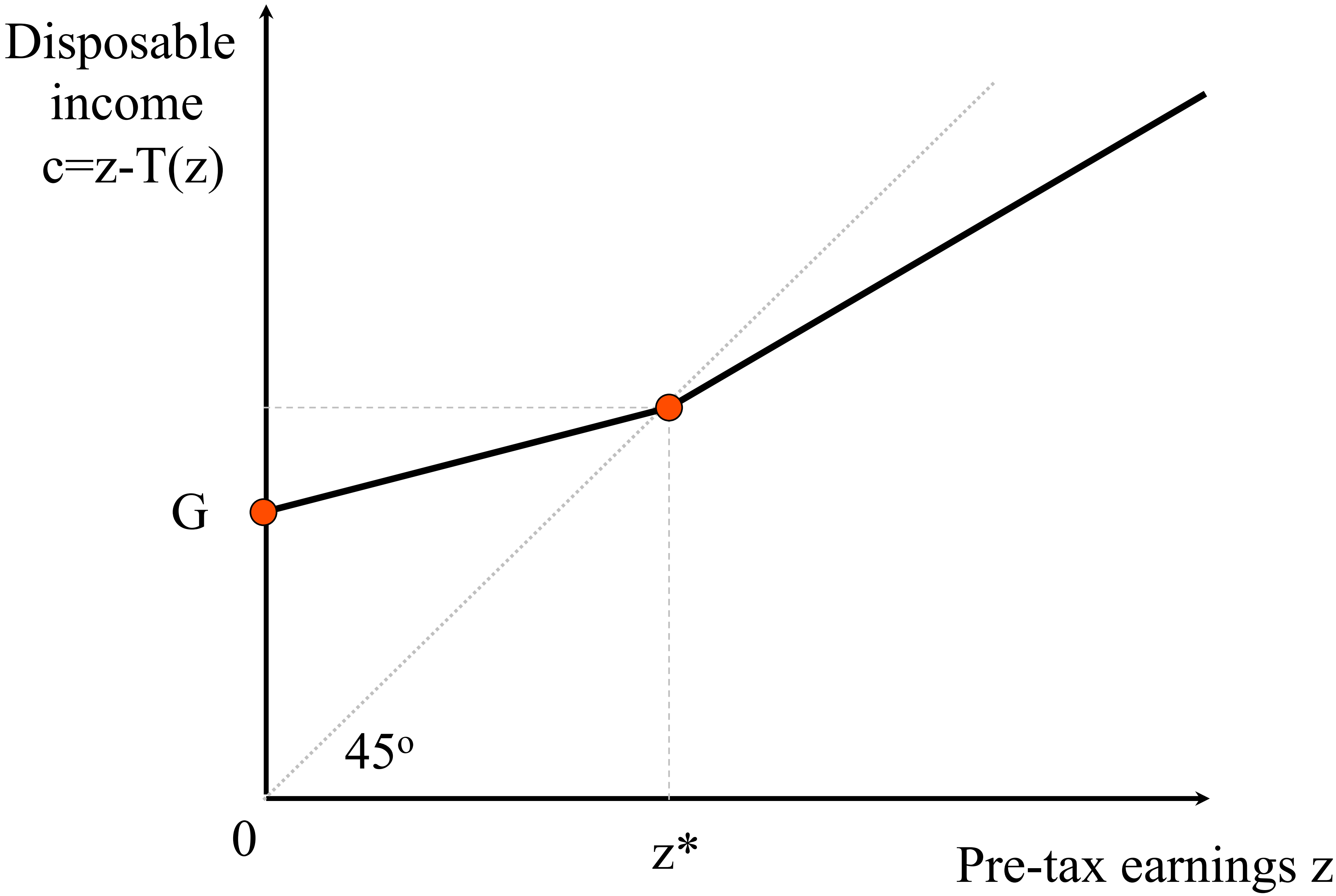
$\Rightarrow T'(0)$ large: e.g. $g_0 = 3$ and $e_0 = .5 \Rightarrow T'(0) = 80\%$

However if $g_0 < 1$ then $T'(0) < 0 \Rightarrow$ EITC is optimal

Reform: Increase τ_1 by $d\tau_1$ and c_0 by $dc_0 = z_1 d\tau_1$



Starting from a means-tested program

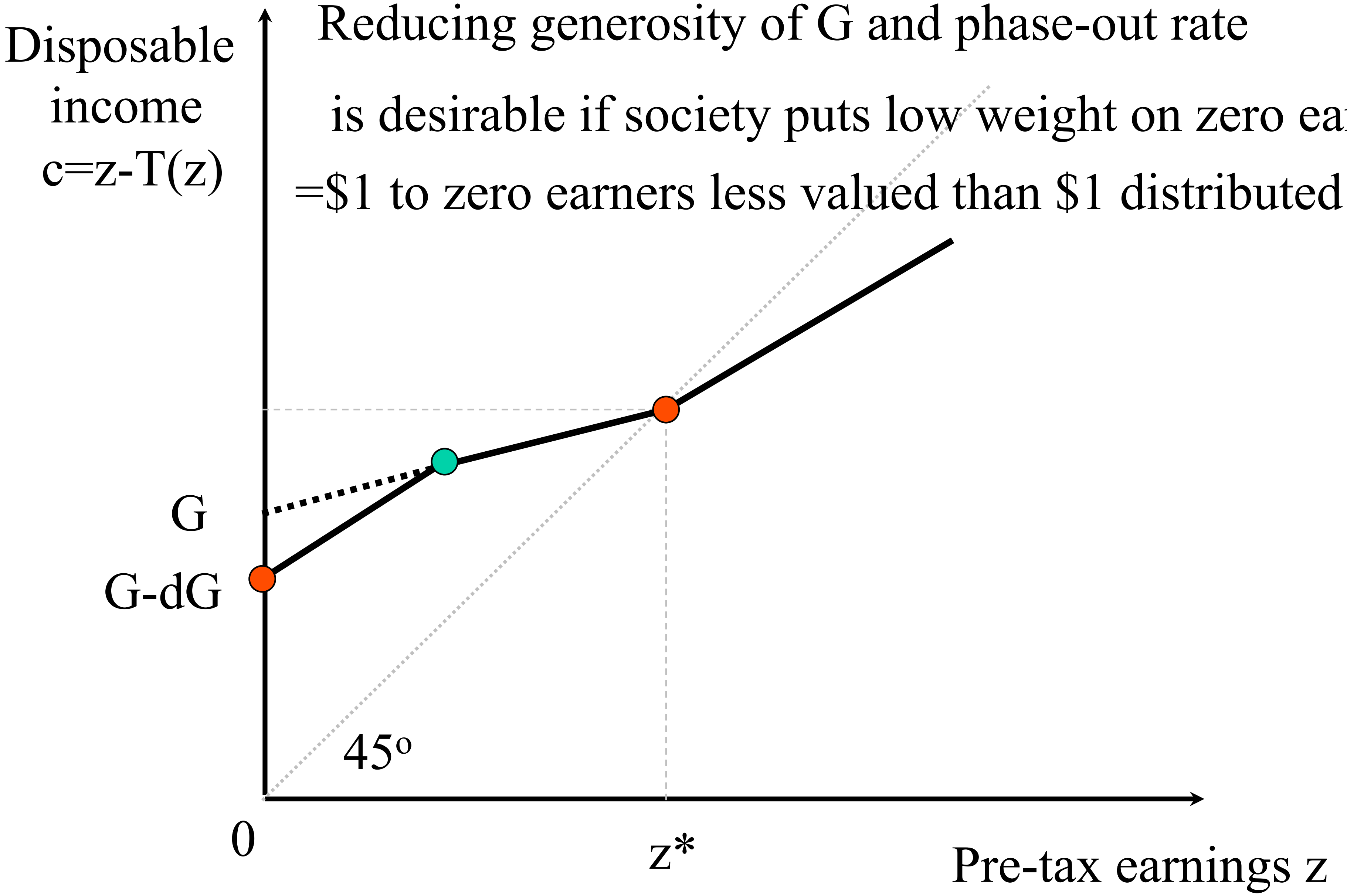


Starting from a means-tested program

Reducing generosity of G and phase-out rate

is desirable if society puts low weight on zero earners

=$1 to zero earners less valued than $1 distributed to all



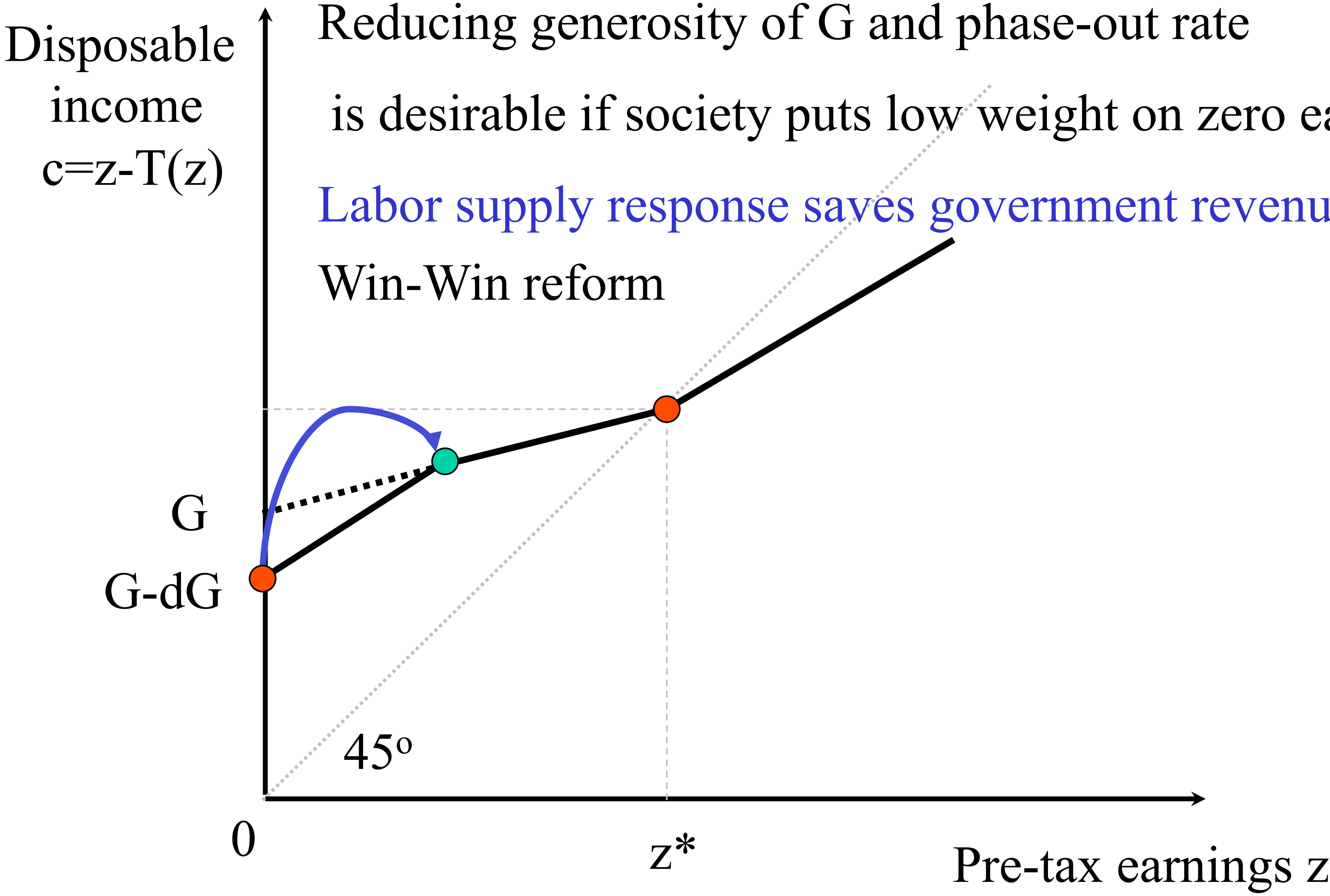
Starting from a means-tested program

Reducing generosity of G and phase-out rate

is desirable if society puts low weight on zero earners

Labor supply response saves government revenue

Win-Win reform



Optimal Transfers: Participation Responses

Empirical literature shows that participation labor supply responses [due to fixed costs of working] are large at the bottom [much larger and clearer than intensive responses]

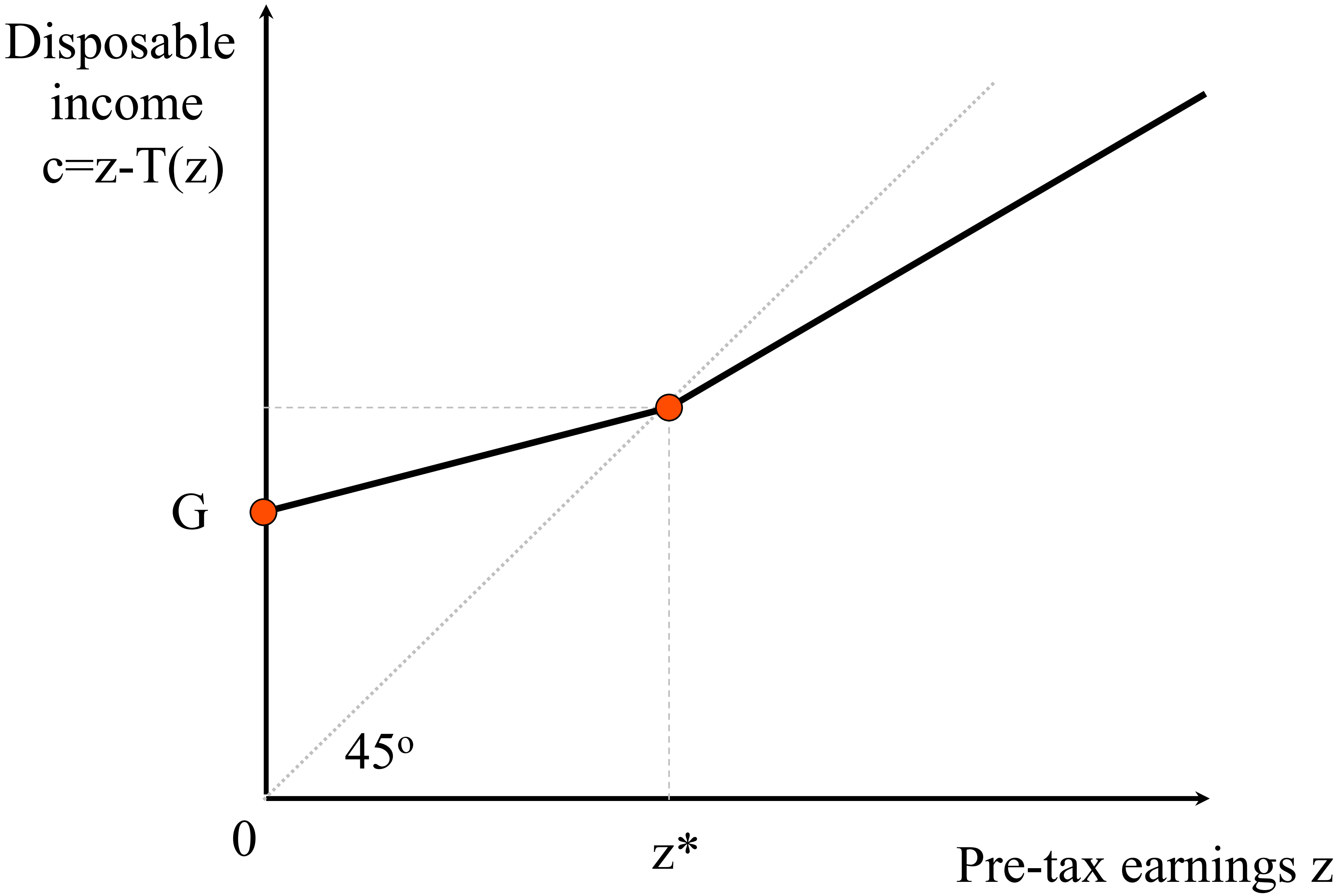
Diamond JpubE'80, Saez QJE'02, Laroque EMA'05 incorporate such extensive labor supply responses in the optimal income tax model

Participation depends on participation tax rate: $\tau_p = [T(z) - T(0)]/z$: individual keeps fraction $1-\tau_p$ of earnings when moving from zero earnings to earnings z:

$$z - T(z) = -T(0) + z - [T(z) - T(0)] = -T(0) + z \cdot (1 - \tau_p)$$

Key result: in-work subsidies with $T'(z) < 0$ (such as EITC) become optimal when labor supply responses are concentrated along extensive margin and social marginal welfare weight on low skilled workers > 1.

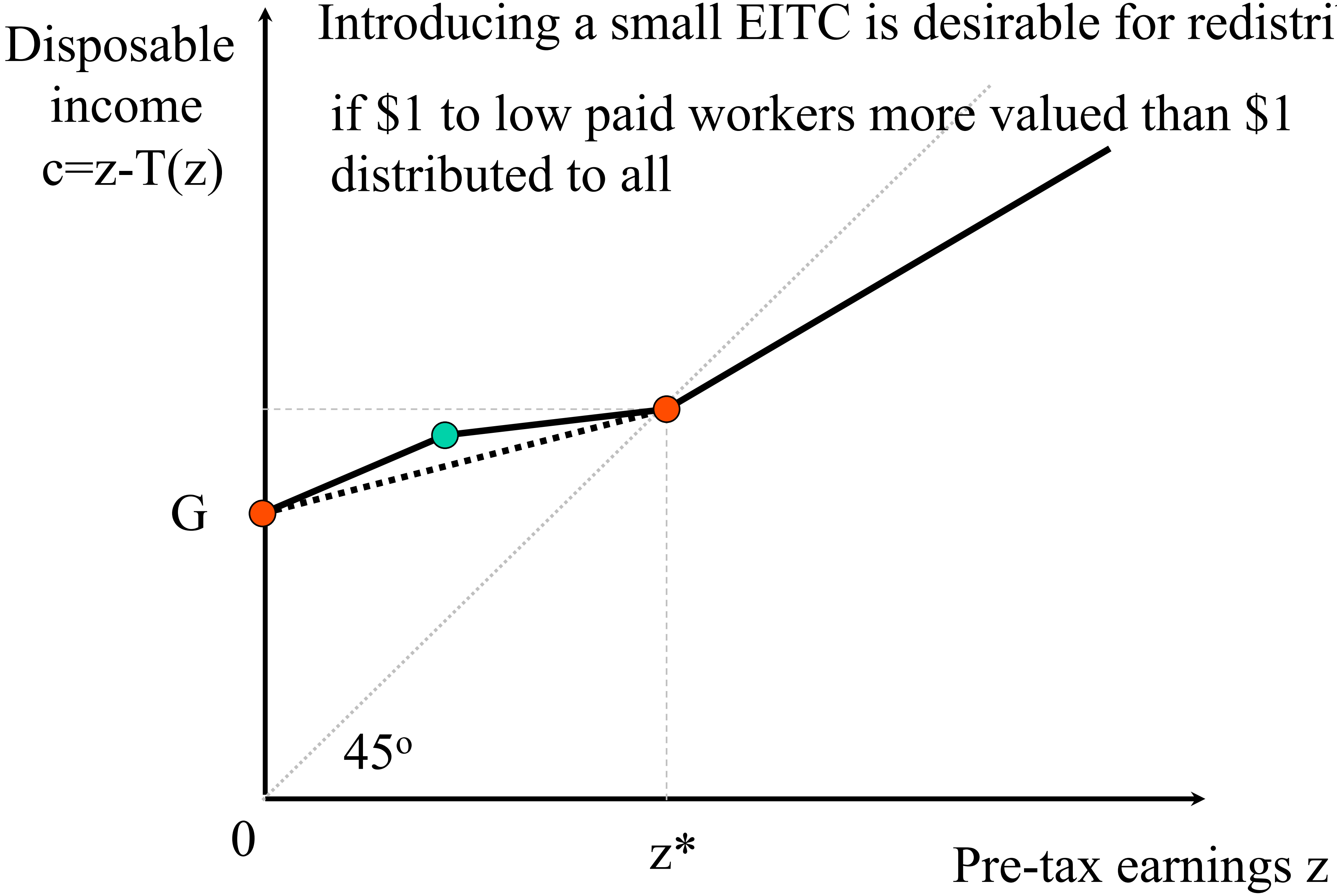
Starting from a means-tested program



Starting from a Means-Tested Program

Introducing a small EITC is desirable for redistribution

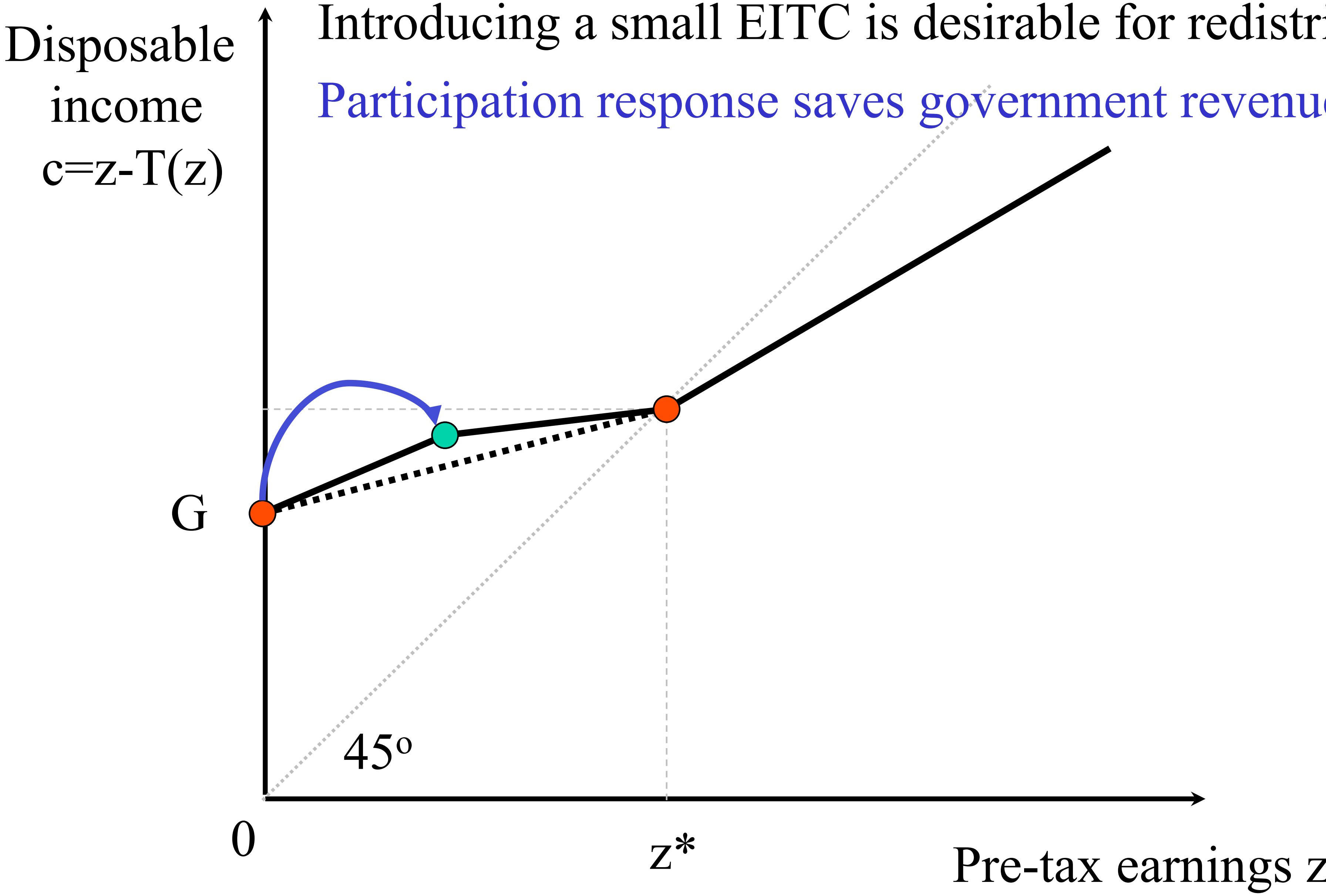
if $1 to low paid workers more valued than $1 distributed to all



Starting from a Means-Tested Program

Introducing a small EITC is desirable for redistribution

Participation response saves government revenue

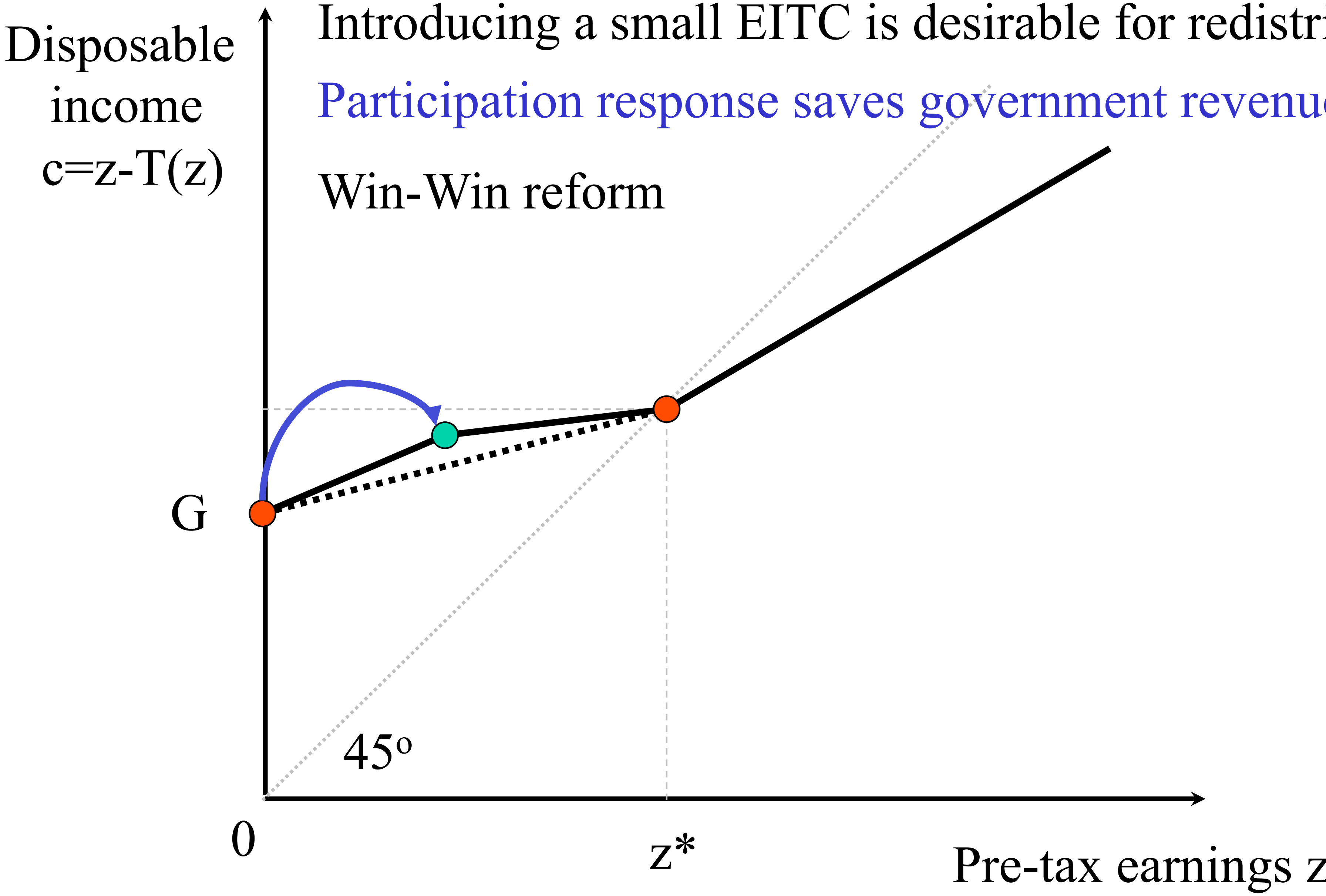


Starting from a Means-Tested Program

Introducing a small EITC is desirable for redistribution

Participation response saves government revenue

Win-Win reform

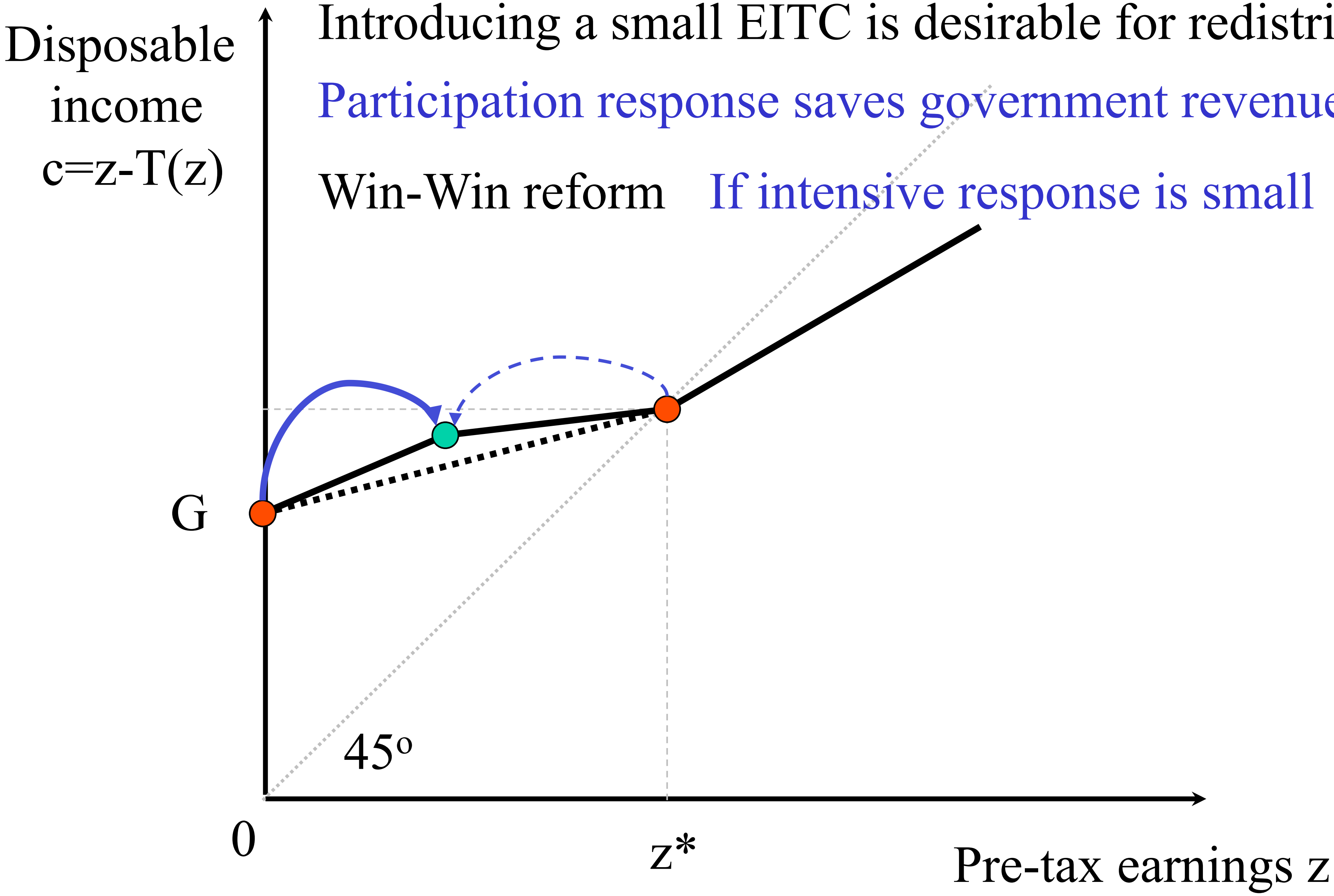


Starting from a Means-Tested Program

Introducing a small EITC is desirable for redistribution

Participation response saves government revenue

Win-Win reform   If intensive response is small



OPTIMAL PROFILE OF TRANSFERS: SUMMARY

1) If society views **zero earners** as less deserving than average [conservative view that substantial fraction of zero earners are "free loaders"] then low lumpsum grant combined with low phasing out rate at bottom is optimal

2) If society views **low income workers** as more deserving than average [typically bipartisan view] and labor supply responses concentrated along extensive margin (work vs. not) then low phasing out rate at bottom is optimal

3) Generous lumpsum grant with high MTR at bottom justified only if society views non workers as deserving and no strong response along the extensive margin (work vs. not)

ACTUAL TAX/TRANSFER SYSTEMS

1) Means-tested transfer programs used to be of the traditional form with high phasing-out rates (sometimes above 100%) $\Rightarrow$ No incentives to work (even with modest elasticities)

Initially designed for groups not expected to work [widows in the US] but later attracting groups who could potentially work [single mothers]

2) In-work benefits have been introduced and expanded in OECD countries since 1980s (US EITC, UK Family Credit, etc.) and have been politically successful $\Rightarrow$ (a) Redistribute to low income workers, (b) improve incentives to work

END OF OPTIMAL TAX LECTURE IN 2025

Remaining slides not covered in 2025

COMMODITY VS. INCOME TAXATION

Suppose we have K consumption goods $c = (c_1, .., c_K)$ with pre-tax price $p = (p_1, .., p_K)$. Individual h has utility $u^h(c_1, .., c_K, z)$

Key question: Can government increase SWF using differentiated commodity taxation $t = (t_1, .., t_K)$ (after tax price $q = p + t$) in addition to nonlinear Mirrlees income tax on earnings z?

In practice, govt (a) exempts some goods (food, education, health) from sales tax or value-added-tax, (b) imposes additional excise taxes on some goods (cars, gasoline, some luxury goods)

$\max_{t,T(.)} SWF \geq \max_{t=0,T(.)} SWF$ because more instruments cannot hurt

ATKINSON-STIGLITZ THEOREM

Famous Atkinson-Stiglitz JpubE' 76 shows that

$$\max_{t,T(.)} SWF = \max_{t=0,T(.)} SWF$$

(i.e, commodity taxes not useful over and above $T(z)$) under **two assumptions** on utility functions $u^h(c_1, .., c_K, z)$

1) Weak separability between $(c_1, .., c_K)$ and z in utility

2) Homogeneity across individuals in the sub-utility of consumption $v(c_1, .., c_K)$ [does not vary with h]

$$\text{(1) and (2):} \quad u^h(c_1, .., c_K, z) = U^h(v(c_1, .., c_K), z)$$

Original proof was based on optimum conditions, new straightforward proof by Laroque EL '05, and Kaplow JpubE '06.

ATKINSON-STIGLITZ THEOREM PROOF (skip)

Let $V(y, p+t) = \max_c v(c_1, .., c_K)$ st $(p+t) \cdot c \leq y$ be the indirect utility of consumption c [common to all individuals]

Start with $(T(.), t)$. Let $c(t)$ be consumer choice.

Replace $(T(.), t)$ with $(\bar{T}(.), t = 0)$ where $\bar{T}(z)$ such that: $V(z - T(z), p + t) = V(z - \bar{T}(z), p)$

$\Rightarrow$ Utility $U^h(V, z)$ and labor supply choices z unchanged for all individuals.

Attaining $V(z - \bar{T}(z), p)$ at price p costs at least $z - \bar{T}(z)$

Consumer also attains $V(z - \bar{T}(z), p) = V(z - T(z), p + t)$ when choosing $c(t) \Rightarrow z - \bar{T}(z) \leq p \cdot c(t) = z - T(z) - t \cdot c(t)$

$\Rightarrow \bar{T}(z) \geq T(z) + t \cdot c(t)$: the government collects more taxes with $(\bar{T}(.), t = 0)$

ATKINSON-STIGLITZ INTUITION (skip)

With separability and homogeneity, conditional on earnings z, consumption choices $c = (c_1, .., c_K)$ do not provide any information on ability

$\Rightarrow$ Differentiated commodity taxes $t_1, .., t_K$ create a tax distortion with no benefit $\Rightarrow$ Better to do all the redistribution with the individual income tax

Note: With weaker linear income taxation tool (Diamond-Mirrlees AER '71, Diamond JpubE '75), need $v(c_1, .., c_K)$ homothetic (linear Engel curves, Deaton EMA '81) to obtain no commodity tax result

[Unless Engel curves are linear, commodity taxation can be useful to "non-linearize" the tax system]

WHEN ATKINSON-STIGLITZ ASSUMPTIONS FAIL (skip)

Thought experiment: force high ability people to work less and earn only as much as low ability people: if higher ability consume more of good k than lower ability people, then taxing good k is desirable. Happens when:

1) High ability people have a relatively higher taste for good k (independently of income) [indirect tagging]

2) Good k is positively related to leisure (consumption of k increases when leisure increases keeping after-tax income constant) [tax on holiday trips, subsidy on work related expenses such as child care]

In general Atkison-Stiglitz assumption is a good starting place for most goods $\Rightarrow$ Zero-rating on some goods under VAT for redistribution is inefficient and administratively burdensome [Mirrlees 2010 review]

ATKINSON-STIGLITZ AND TAX ON SAVINGS (skip)

Standard two period model (w=wage rate in period 1, retired in period 2)

$$u^h(c_1, c_2, z) = u(c_1) - b(z/w) + \frac{u(c_2)}{1+\delta}$$

δ is the discount rate, $b(.)$ is the disutility of effort, budget $c_1 + c_2/(1 + r(1 - t_K)) \leq z - T(z)$

Aktinson-Stiglitz implies that savings taxation t_K (equivalent to tax on c_2) is useless in the presence of an optimal income tax if δ is the same for everybody

If low ability people have higher δ [empirically plausible] then savings tax $t_K > 0$ is desirable (Saez JpubE '02)

Ferey-Lockwood-Taubinsky '21 provide formulas for t_K

IN-KIND REDISTRIBUTION

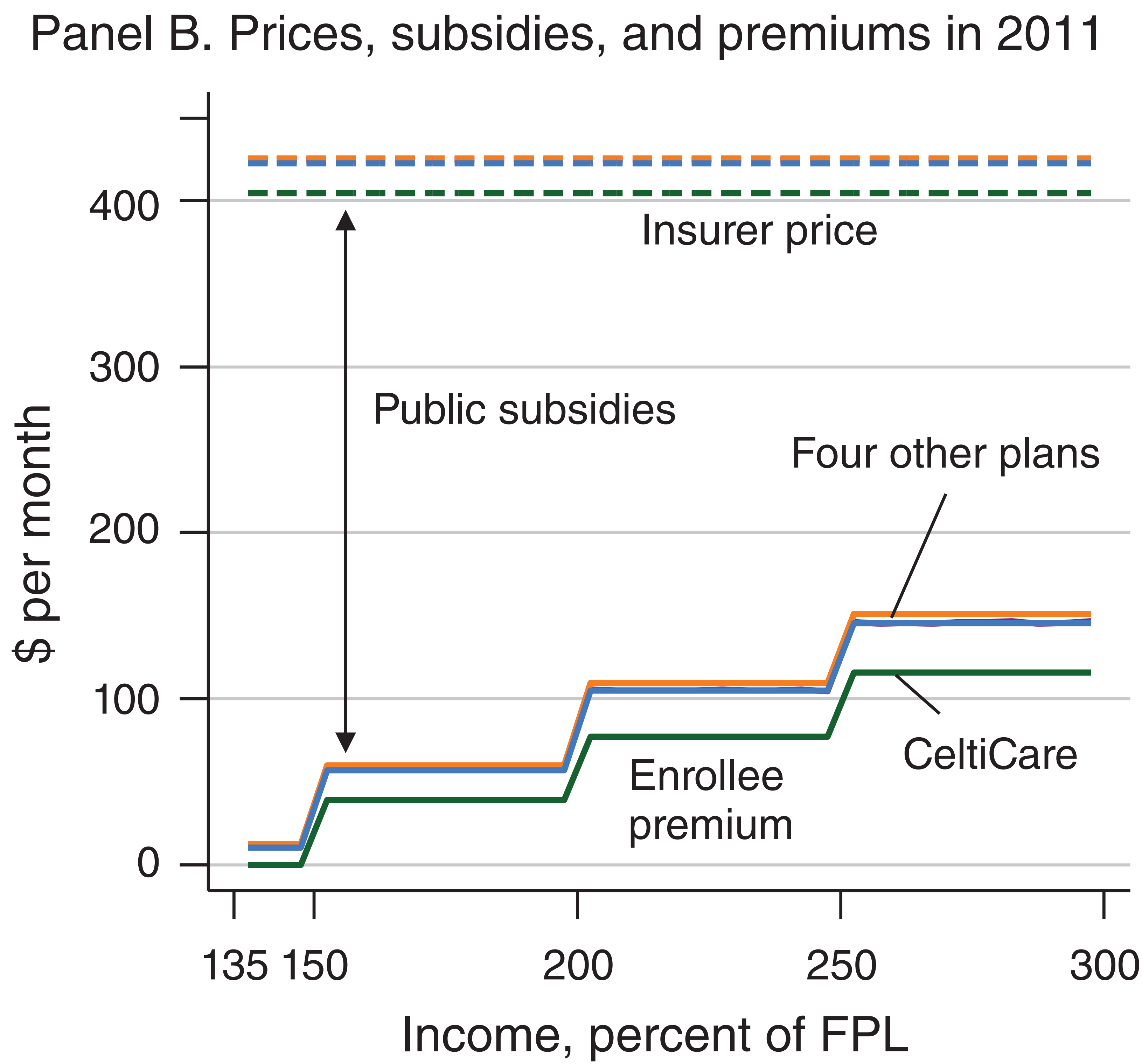
Majority of actual transfers are in-kind (health care, child care, education, public housing, nutrition subsidies)

1) **Rational Individual perspective:**

(a) In-kind transfer is **tradeable** at market price $\Rightarrow$ in-kind equivalent to cash (and worse than cash if corner is hit)

(b) In-kind transfer **non-tradeable** $\Rightarrow$ in-kind inferior to cash

Various studies show that willingness to pay for health insurance much less than resource cost for many beneficiaries (e.g. Finkelstein-Hendren-Shepard AER'19 for subsidized health care in Massachussets "Romneycare").



Source: Finkelstein, Hendren, Shepard AER'19

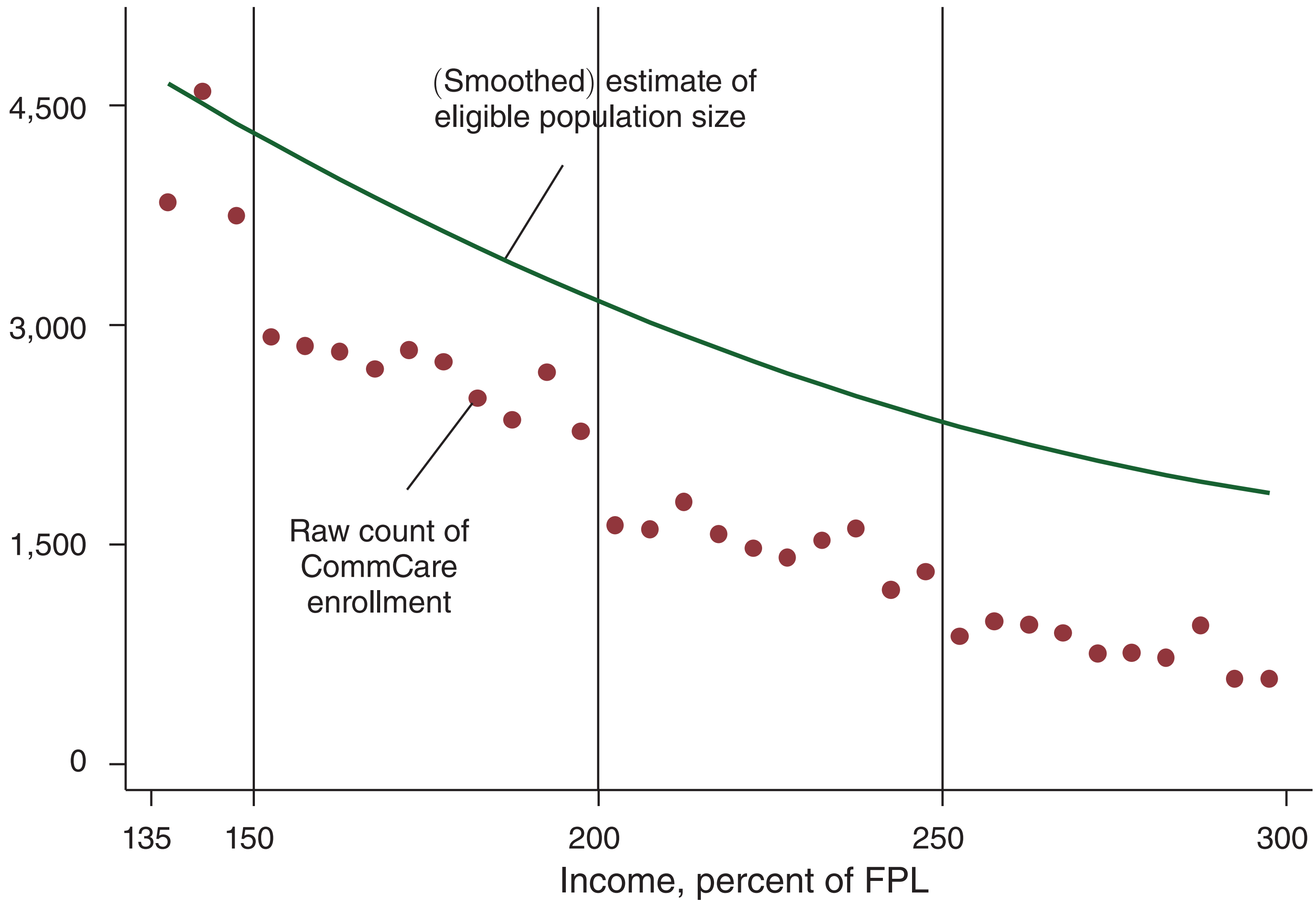


FIGURE 4. ELIGIBLE AND ENROLLED POPULATION, 2011

Notes: Figure shows our (smoothed) estimate of the CommCare-eligible population in 2011 (based on ACS data), and raw enrollment counts in CommCare in 2011 by bins of 5 percent of the FPL.

IN-KIND REDISTRIBUTION

2) **Social perspective:** 4 justifications:

a) Commodity Egalitarianism: some goods (education, health, shelter, food) seen as **rights** and ought to be provided to all

Quality education and health care unaffordable for bottom 50% even in rich countries.

b) Paternalism: society imposes its preferences on recipients [recipients prefer cash]

c) Behavioral: Recipients do not make choices in their best interests (cognitive, self-control, myopia) [recipients understand that in-kind is better for them]

d) Under standard welfarist objective: Efficiency considerations in a 2nd best context

EFFICIENCY OF IN-KIND REDISTRIBUTION

Depends on what income tax tools are available:

1) No income tax: Income z not observable (devo countries) $\Rightarrow$ In-kind provision or subsidies for necessities desirable (e.g., food security in India)

2) Nonlinear income tax: Under Atkinson-Stiglitz assumption [weak-separability and homogeneity $U^h(v(c_1,..,c_K),z)$] $\Rightarrow$ Any distortion (quota, rationing, subsidy) involving c choices not desirable provided $T(z)$ optimal

If good c_k related to leisure/ability [e.g. soup kitchen with queuing requirement] then A-S fails and in-kind redistribution possibly desirable even with optimal $T(z)$

IMPOSING ORDEALS ON TRANSFER RECIPIENTS

Many actual transfer programs impose requirements on beneficiaries (complex application, job search, training, or work requirements) and hence have low take-up (often $< 50\%$)

1) If social objective is welfarist and income z observable: ordeals unlikely to be desirable:

Compare ordeal to benefit cut: (a) only benefit cut saves money mechanically, (b) both reduce welfare of recipients, (c) both reduce take-up [good fiscally]

Need implausible sorting effects for ordeal to be desirable [e.g., ordeal does not hurt much deserving beneficiaries and discourages undeserving take-up, conditional on z]

2) If z is not observable then ordeal could be desirable (kitchen soup line)

3) With non-welfarist objective [such as poverty alleviation], ordeal can be desirable [Besley-Coate AER'92]

FAMILY TAXATION: MARRIAGE AND CHILDREN

Two important issues in policy debate:

1) Marriage: What is the optimal taxation of couples vs. singles? Should secondary earnings be treated differently?

2) Children: What should be the net transfer (transfer or tax reduction) for family with children (as a function of family income and structure)?

Theoretical literature is not great in part because utilitarian framework is not satisfactory

TAXATION OF COUPLES

1) Economies of scale and sharing in consumption within families $\Rightarrow$ Welfare best measured by family income relative to size [$\equiv$ **normalized income**]

$\Rightarrow$ Taxes/Transfers should be based on normalized family income which can create a marriage penalty / subsidy

Note: Impossible to have a tax/transfer system that

(1) is family income based $T(z^h + z^w)$

(2) has marriage neutrality $T(z^h, z^w) = T(z^h) + T(z^w)$

(3) is progressive (i.e., not strictly linear)

Proof: (1)+(2) $\Rightarrow T(z^h + z^w) = T(z^h) + T(z^w) \Rightarrow T(z) = \tau \cdot z$

TAXATION OF COUPLES

2) If marriage responds to tax/transfer differential $\Rightarrow$ better to reduce marriage penalty and move toward individualized system

Particularly important cohabitation is close substitute to marriage (Scandinavian countries)

3) Labor supply of secondary earners more elastic than labor supply of primary earner $\Rightarrow$ Secondary earnings should be taxed less (standard Ramsey intuition, Boskin-Sheshinski JpubE'83)

But labor supply elasticity differential is decreasing as earnings gender gap decreases [Blau and Kahn JOLE'07]

In OECD countries: income tax systems have become **individual based** but means tested transfers have remained **family based**

TRANSFERS OR TAX CREDITS FOR CHILDREN

1) Children reduce **normalized income** $\Rightarrow$ Transfer for children T_{kid} should be positive

In practice, transfers for children are always positive

2) Should $T_{kid}(z)$ increase with income z?

Pro: they reduce normalized income most for upper earners [e.g., France computes taxes as $N \cdot T(z/N)$ where N is # family members, kids count as .5 $\Rightarrow T_{kid}(z)$ increases with z].

Cons: lower earners need child transfers most [most OECD countries have means-tested transfers conditional on number of kids $\Rightarrow T_{kid}(z)$ decreases with z, US has $T_{kid}(z)$ inverted U-shape due to EITC and Child Tax Credit]

TRANSFERS OR TAX CREDITS FOR CHILDREN

3) Family does not make decisions as a single unit (Chiappori JPE'92): transfers to mothers has bigger effects on children's consumption than transfers to fathers [Lundberg et al. '97, Duflo '03]

4) Child care costs are positively related to work $\Rightarrow$ Such costs should be subsidized by Atkinson-Stiglitz [often they are in practice]:

Public pre-kindergarten in Europe is a huge in-work subsidy for mothers $\Rightarrow$ Large effect on mothers' labor force participation (bigger effect than US EITC)

LIMITS OF WELFARIST APPROACH

Welfarism is the dominant approach in optimal taxation

Welfarism: social objective is a sole function of individual utilities

Tractable and coherent framework that captures the equity-efficiency trade-off but generates puzzles:

(a) 100% taxation absent behavioral responses

(b) Whether income is deserved or due to luck is irrelevant

(c) What transfer recipients would have done absent transfers is irrelevant

A number of alternatives to welfarism have been proposed

Saez-Stantcheva '16 propose "generalized social welfare weights" to resolve those puzzles. Stantcheva '21: surveys on how people think about taxes.

TESTING PEOPLE SOCIAL PREFERENCES

Saez-Stantcheva '16 survey people online (using Amazon MTurk) by asking hypothetical questions to elicit social preferences:

1) People typically do not have "utilitarian" social justice principles (consumption lover not seen as more deserving than frugal person)

2) People put weight on whether income has been earned through effort vs. not (hard working vs. leisure lover)

3) People put weight of what people would have done absent the government intervention (deserving poor vs. free loaders)

4) People put weight on taxes paid conditional on c: person earning z=$50K, paying T=$15K, netting c=$35K more deserving than person with z=$40K, T=$5K, c=$35K

$\Rightarrow$ Aversion for free loaders and liking tax contributors is like an intuitive or evolutionary optimal tax tool (needed to sustain cooperative societies)

Which of the following two individuals do you think is most deserving of a $1,000 tax break?

Individual A earns $50,000 per year, pays $10,000 in taxes and hence nets out $40,000. She greatly enjoys spending money, going out to expensive restaurants, or traveling to fancy destinations. She always feels that she has too little money to spend.

Individual B earns the same amount, $50,000 per year, also pays $10,000 in taxes and hence also nets out $40,000. However, she is a very frugal person who feels that her current income is sufficient to satisfy her needs.

- Individual A is most deserving of the $1,000 tax break
- Individual B is most deserving of the $1,000 tax break
- Both individuals are exactly equally deserving of the tax $1,000 break

>>

Source: survey in Saez and Stantcheva (2013)

Which of the following two individuals is most deserving of a $1,000 tax break?

Individual A earns $30,000 per year, by working in two different jobs, 60 hours per week at $10/hour. She pays $6,000 in taxes and nets out $24,000. She is very hard-working but she does not have high-paying jobs so that her wage is low.

Individual B also earns the same amount, $30,000 per year, by working part-time for 20 hours per week at $30/hour. She also pays $6,000 in taxes and hence nets out $24,000. She has a good wage rate per hour, but she prefers working less and earning less to enjoy other, non-work activities.

- Individual A is most deserving of the $1,000 tax break
- Individual B is most deserving of the $1,000 tax break
- Both individuals are exactly equally deserving of the $1,000 tax break

>>

Source: survey in Saez and Stantcheva (2013)

We assume now that the government can increase benefits by $1,000 for some recipients of government benefits.

Which of the following four individuals is most deserving of the $1,000 increase in benefits?

Please drag and drop the four individuals into the appropriate boxes on the left. The upper box, marked 1 should contain the individual you think is most deserving. The box labeled "2" should contain the second most-deserving individual, etc.. Please note that you can put two individuals in the same box if you think that they are equally deserving.

Individual A gets $15,000 per year in Disability Benefits because she cannot work due to a disability and has no other resources.

Individual B gets $15,000 per year in Unemployment Benefits and has no other resources. She lost her job and has not been able to find a new job even though she has been actively looking for one.

Individual C gets $15,000 pear year in Unemployment Benefits and has no other resources. She lost her job but has not been looking actively for a new job, because she prefers getting less but not having to work.

Individual D gets $15,000 per year in Welfare Benefits and Food Stamps and has no other resources. She is not looking for a job actively because she can get by living off those government provided benefits.

Source: survey in Saez and Stantcheva (2013)

Table 2: Revealed Social Preferences

	(1)	(2)	(3)	(4)
A. Consumption lover vs. Frugal				
	Consumption lover > Frugal	Consumption lover = Frugal	Consumption lover < Frugal	
# obs. = 1,125	4.1%	74.4%	21.5%	
B. Hardworking vs. leisure lover				
	Hardworking > Leisure lover	Hardworking = Leisure lover	Hardworking < Leisure lover	
# obs. = 1,121	42.7%	54.4%	2.9%	
C. Transfer Recipients and free loaders				
# obs. = 1,098	Disabled person unable to work	Unemployed looking for work	Unemployed not looking for work	Welfare recipient not looking for work
Average rank (1-4) assigned	1.4	1.6	3.0	3.5
% assigned first rank	57.5%	37.3%	2.7%	2.5%
% assigned last rank	2.3%	2.9%	25.0%	70.8%

Notes: This table reports preferences for giving a tax break and or a benefit increase across individuals in various scenarios. Panel A considers two individuals with the same earnings, same taxes, and same disposable income but high marginal utility of income (consumption lover) vs. low marginal utility of income (frugal). In contrast to utilitarianism, 74% of people report that consumption loving is irrelevant and 21.5% think the frugal person is most deserving. Panel B considers two individuals with the same earnings, same taxes, and same disposable income but different wage rates and hence different work hours. 54.4% think hours of work is irrelevant and 42.7% think the hardworking low wage person is more deserving. Panel C considers transfer recipients receiving the same benefit levels. Subjects find the disabled person unable to work and the unemployed person looking for work much more deserving than the abled bodied unemployed or welfare recipient not looking for work.

Generalized Social Marginal Welfare Weights (skip)

Social planner uses **generalized social marginal welfare weights** $g_i \geq 0$ to value marginal consumption of individual i

Standard utilitarian case $SWF = \int_i u^i$ has $g_i = u_c^i$

But we can define generalized g_i that might depend on fairness judgements as well

Optimal tax criterion: $T(z)$ is optimal if for any budget **neutral** small tax reform $dT(z)$, $\int_i g_i \cdot dT(z_i) = 0$ with $g_i \geq 0$ generalized social marg. welfare weight on indiv. i

1) Generates same optimal tax formulas as welfarist approach

2) Respects (local) constrained Pareto efficiency ($g_i \geq 0$)

3) No social objective is maximized

Application 1: Optimal Tax with Fixed Incomes (skip)

Utilitarian approach has degenerate solution with 100% taxation when $u'(c)$ decreases with c

Public may not support confiscatory taxation even absent behavioral responses

Generalized social marginal welfare weights: $g_i = g(c_i, T_i)$

$g(c, T)$ decreases with c (ability to pay)

$g(c, T)$ increases with T (contribution to society)

Optimum: $g(z - T(z), T(z))$ equalized across z

$\Rightarrow T'(z) = 1/(1 - g_T/g_c)$ and $0 \leq T'(z) \leq 1$

Application 1: Optimal Tax with Fixed Incomes (skip)

Preferences for redistributions embodied in $g(c, T)$

Polar cases:

1) Utilitarian case: $g(c, T) = u'(c) \Rightarrow T'(z) \equiv 1$

2) Libertarian case: $g(c, T) = g(T) \Rightarrow T'(z) \equiv 0$

We use Amazon mTurk online survey to estimate $g(c, T)$

We find that revealed preferences depend on **both** c and T

z=$40K, T=$10K, c=$30K more deserving than z=$50K, T=$10K, c=$40K

z=$50K, T=$15K, c=$35K more deserving than z=$40K, T=$5K, c=$35K

Application 2: FREE LOADERS (skip)

Saez-Stantcheva '16 online survey shows strong public preference for redistributing toward "deserving poor" (unable to work or trying hard to work) rather than "undeserving poor" (who would work absent transfers)

Generalized social welfare weights can capture this by setting $g_i = 0$ on free loaders (=transfer recipients who would have worked absent the transfer) $\Rightarrow$

1) Behavioral responses reduce desirability of transfers (over and above standard budgetary effect)

2) In-work benefit ($T'(0) = (g_0 - 1)/(g_0 - 1 + e_0) < 0$ at bottom becomes optimal in Mirrlees (1971) optimal tax model if $g_0 < 1$

LINK WITH OTHER JUSTICE PRINCIPLES (skip)

Various alternatives to welfarism have been proposed (survey Fleurbaey-Maniquet '11)

Each alternative can be recast in terms of implied **generalized social marginal welfare weights** (as long as it generates constrained Pareto efficient optima)

In all cases, we can use simple and tractable optimal income tax formula for heterogeneous population from Saez Restud'01 (case with no income effects):

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

with $G(z)$ average of g_i above z

g_i average to one in the full population and hence $G(0) = 1$

LINK WITH OTHER JUSTICE PRINCIPLES (skip)

1) Rawlsian: g_i concentrated on worst-off individual $\Rightarrow G(z) = 0$ for $z > 0$ and $T'(z) = 1/(1 + \alpha(z) \cdot e)$ revenue maximizing

2) Libertarian: $g_i \equiv 1 \Rightarrow G(z) \equiv 1$ and $T'(z) \equiv 0$

3) Equality of Opportunity: (Roemer '98) g_i concentrated on those coming from disadvantaged background. $G(z)$= relative fraction of individuals above z coming from disadvantaged background

$\Rightarrow G(z)$ decreases with z for reasons unrelated to decreasing marginal utility

Table 2: Equality of Opportunity vs. Utilitarian Optimal Tax Rates

	Equality of Opportunity			Utilitarian (log-utility)	
	Fraction from low background (=parents below median) above each percentile	Implied social welfare weight G(z) above each percentile	Implied optimal marginal tax rate at each percentile	Utilitarian social welfare weight G(z) above each percentile	Utilitarian optimal marginal tax rate at each percentile
	(1)	(2)	(3)	(4)	(5)
Income percentile					
z= 25th percentile	44.3%	0.886	53%	0.793	67%
z= 50th percentile	37.3%	0.746	45%	0.574	58%
z= 75th percentile	30.3%	0.606	40%	0.385	51%
z= 90th percentile	23.6%	0.472	34%	0.255	42%
z= 99th percentile	17.0%	0.340	46%	0.077	54%
z= 99.9th percentile	16.5%	0.330	47%	0.016	56%

Notes: This table compares optimal marginal tax rates at various percentiles of the distribution (listed by row) using an equality of opportunity criterion (in column (3)) and a standard utilitarian criterion (in column (5)). Both columns use the optimal tax formula $T'(z)=[1-G(z)]/[1-G(z)+\alpha(z)*e]$ discussed in the text where G(z) is the average social marginal welfare weight above income level z, $\alpha(z)=(zh(z))/(1-H(z))$ is the local Pareto parameter (with h(z) the density of income at z, and H(z) the cumulative distribution), and e the elasticity of reported income with respect to 1-T'(z). We assume e=0.5. We calibrate $\alpha(z)$ using the actual distribution of income based on 2008 income tax return data. For the equality of opportunity criterion, G(z) is the representation index of individuals with income above z who come from a disadvantaged background (defined as having a parent with income below the median). This representation index is estimated using the national intergenerational mobility statistics of Chetty et al. (2013) based on all US individuals born in 1980-1 with their income measured at age 30-31. For the utilitarian criterion, we assume a log-utility so that the social welfare weight g(z) at income level z is proportional to 1/(z-T(z)).

Source: Saez and Stantcheva (2014)

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