Lecture 1: Intro: Public Econ and the Tax & Transfer System

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Fall 2019

Our Goals for this class

1. Learn skills and methods (theory and empirical).
2. Create a culture of key papers and read widely.
3. Get you inspired and ready for your own research.

Class Logistics

- Meet twice per week, 1 hour 15 mins.
- Regular schedule except classes from 10/23 and 10/30 replaced with a 2.5 hour block on 11/8, 9–11:30 am.
- One problem set.
- One final exam.
- Office hours posted on Ec2450A OH link on my website.
- What I expect from you.

My research:

I study the taxation of firms and individuals. I focus on three main issues:

1) The long-run effects of taxes on innovation, education & training, and wealth. How can we design the tax system to foster innovation?

2) The determinants of our social preferences, attitudes, and perceptions, which ultimately drive support for redistribution. To answer this, I conduct large-scale online surveys and experiments.

3) The effects of taxes in imperfect markets with informational frictions and rents.

PUBLIC ECONOMICS DEFINITION

Public economics = Study of the role of the government in the economy

Government is instrumental in most aspects of economic life:

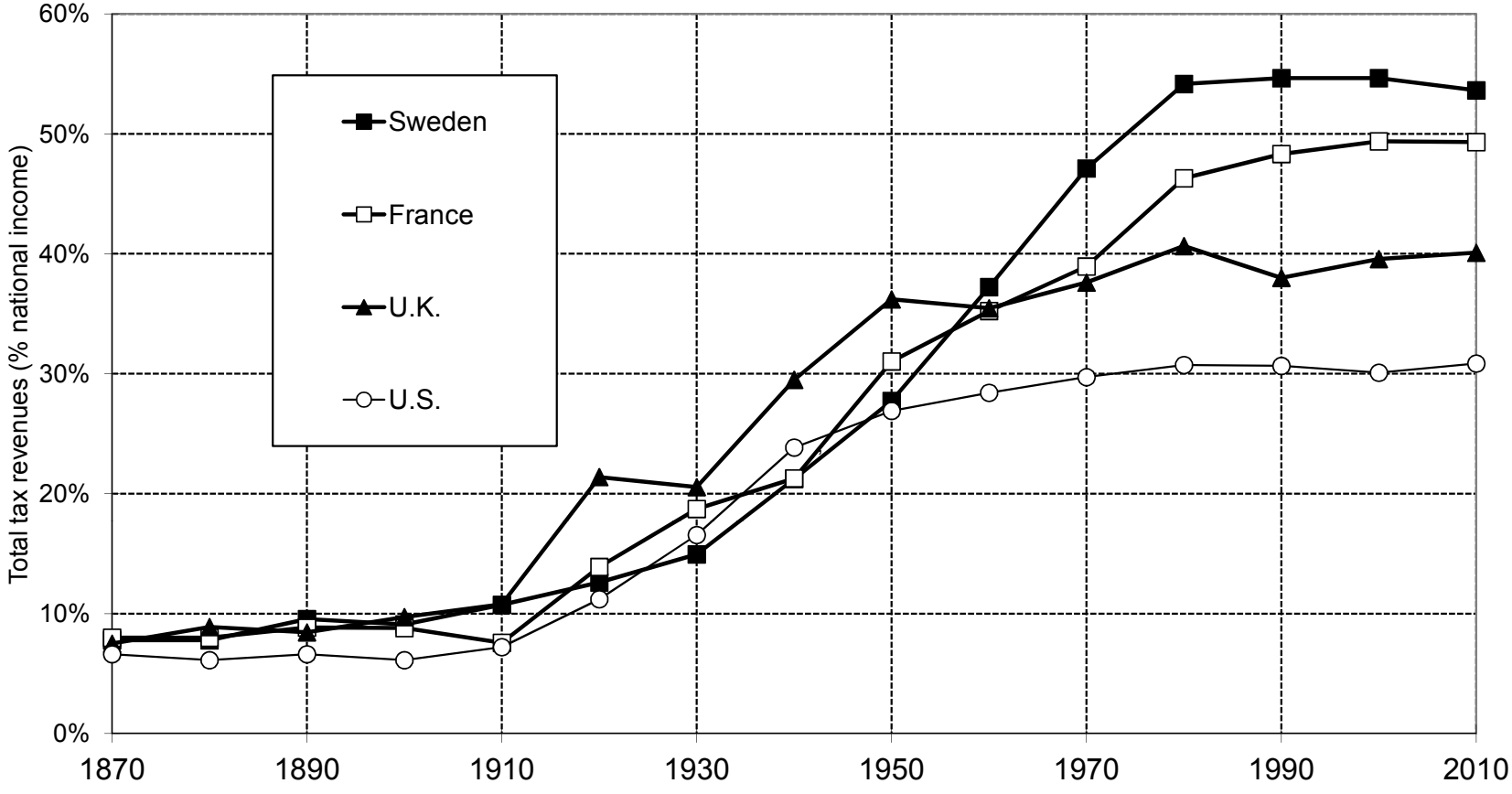
1) Government in charge of huge regulatory structure

2) Taxes: governments in advanced economies collect 30-50% of National Income in taxes

3) Expenditures: tax revenue funds traditional **public goods** (infrastructure, public order and safety, defense), and **welfare state** (education, retirement benefits, health care, income support)

4) Macro-economic stabilization through central bank (interest rate, inflation control), fiscal stimulus, bailout policies

Figure 13.1. Tax revenues in rich countries, 1870-2010



Total tax revenues were less than 10% of national income in rich countries until 1900-1910; they represent between 30% and 55% of national income in 2000-2010. Sources and series: see piketty.pse.ens.fr/capital21c.

Source: Piketty (2014)

Bigger view on government

Economists have a narrow minded view of individual behavior: selfish, rational, and utility based on own consumption only

But social interactions are critical for humans: we naturally cooperate at many levels: families, communities, nation states, global treaties

Governments are a formal way to organize cooperation

Archaic human societies depended on social cooperation for protection and taking care of the young, sick, and old

$\Rightarrow$ Explains best why our modern nation states have defense and provide education, health care, and retirement benefits

Replacing social institutions by markets does not always work

E.g., Retirement benefits: Saving for your own retirement is economically rational but in practice most people unable to do so unless institutions (employers/government) help them

For Economists: Two General Rules for Government Intervention

1) Failure of 1st Welfare Theorem: Government intervention can help if there are market or individual failures. Markets first, government second. Why?

2) Fallacy of the 2nd Welfare Theorem: Distortionary Government intervention is required to reduce economic inequality

Role 1: 1st Welfare Theorem Failure

1st Welfare Theorem: If (1) no externalities, (2) perfect competition, (3) perfect information, (4) agents are rational, then private market equilibrium is Pareto efficient

Government intervention may be desirable if:

1) Externalities require government interventions (Pigouvian taxes/subsidies, public good provision)

2) Imperfect competition requires regulation (typically studied in Industrial Organization)

3) Imperfect or Asymmetric Information (e.g., adverse selection may call for mandatory insurance)

4) Agents are not rational (= **individual failures** analyzed in behavioral economics, field in huge expansion): e.g., myopic or hyperbolic agents may not save enough for retirement

1. Externalities

Markets may be incomplete (e.g., smoking, pollution).

Achieving the Coasian efficient solution requires a coordinating institution, such as a government.

Public goods (infrastructure, defense, education).

Important question: what public goods to provide, how to correct for externalities.

2. Imperfect competition

Role for government regulation when markets are not competitive.

We will see some of this when we study R&D policies and innovation.

Typically we leave this to IO, but we shouldn't!

3. Imperfect and asymmetric information

Adverse Selection in health insurance (reason for mandated coverage).

Capital markets and credit constraints (subsidies for education).

Intergenerational issues (future generations may not be valued appropriately in today's market).

4. Individual Failures

Behavioral issues, own-agency problems.

If agents do not optimize, may be best to intervene. E.g.: mandated retirement savings.

Paternalism?

Currently very active area of research, theoretically and empirically.

Individual Failures vs. Paternalism

In many situations, individuals may not or do not seem to act in their best interests [e.g., many individuals are not able to save for retirement]

Two Polar Views on such situations:

1) **Individual Failures [Behavioral Economics View]** Individual Failures exist: Self-control problems, Cognitive Limitations

2) **Paternalism [Libertarian Chicago View]** Individual failures do not exist and govt wants to impose on individuals its own preferences against individuals' will

Key way to distinguish those 2 views: Under Paternalism, individuals should be opposed to govt programs such as Social Security. If individuals understand they have failures, they will tend to support govt programs such as Social Security.

Role 2: 2nd Welfare Theorem Fallacy

Even with no market failures, free market might generate substantial inequality. Inequality is an issue because of people care about their relative situation.

2nd Welfare Theorem: Any Pareto Efficient outcome can be reached by (1) Suitable redistribution of initial endowments [individualized **lump-sum** taxes based on indiv. characteristics and not behavior], (2) Then letting markets work freely

$\Rightarrow$ No conflict between efficiency and equity [1st best taxation]

Redistribution of initial endowments is not feasible (information pb) $\Rightarrow$ govt needs to use **distortionary** taxes and transfers $\Rightarrow$ Trade-off between efficiency and equity [2nd best taxation]

This class will focus on both roles, but first on 2).

Illustration of 2nd Welfare Theorem Fallacy

Suppose economy is populated 50% with disabled people unable to work (hence they earn \$0) and 50% with able people who can work and earn \$100

Free market outcome: disabled have \$0, able have \$100

2nd welfare theorem: govt is able to tell apart the disabled from the able [even if the able do not work]

$\Rightarrow$ can tax the able by \$50 [regardless of whether they work or not] to give \$50 to each disabled person $\Rightarrow$ the able keep working [otherwise they'd have zero income and still have to pay \$50]

Real world: govt can't tell apart disabled from non working able

$\Rightarrow$ \$50 tax on workers + \$50 transfer on non workers destroys all incentives to work $\Rightarrow$ govt can no longer do full redistribution $\Rightarrow$ Trade-off between equity and size of the pie

Normative vs. Positive Public Economics

Normative Public Economics: Analysis of How Things Should be (e.g., should the government intervene in health insurance market? how high should taxes be?, etc.)

Positive Public Economics: Analysis of How Things Really Are (e.g., Does govt provided health care crowd out private health care insurance? Do higher taxes reduce labor supply?)

Positive Public Economics is a required 1st step before we can complete Normative Public Economics

Positive analysis is primarily empirical and Normative analysis is primarily theoretical

Positive Public Economics overlaps with Labor Economics

Political Economy is a positive analysis of govt outcomes [public choice is political economy from a libertarian view]

Govt Redistribution with Taxes and Transfers

Government taxes individuals based on income and consumption and provides transfers: z is pre-tax income, $y = z - T(z) + B(z)$ is post-tax income

1) If inequality in y is less than inequality in $z \Leftrightarrow$ tax and transfer system is redistributive (or progressive)

2) If inequality in y is more than inequality in $z \Leftrightarrow$ tax and transfer system is regressive

a) If $y = z \cdot (1 - t)$ with constant t, tax/transfer system is neutral

b) If $y = z \cdot (1 - t) + G$ where G is a universal (lumpsum) allowance, then tax/transfer system is progressive

c) If $y = z - T$ where T is a uniform tax (poll tax), then tax/transfer system is regressive

Current tax/transfer systems in rich countries look roughly like b)

US Distributional National Accounts

Piketty-Saez-Zucman NBER'16 distribute both pre-tax and post-tax US national income across adult individuals

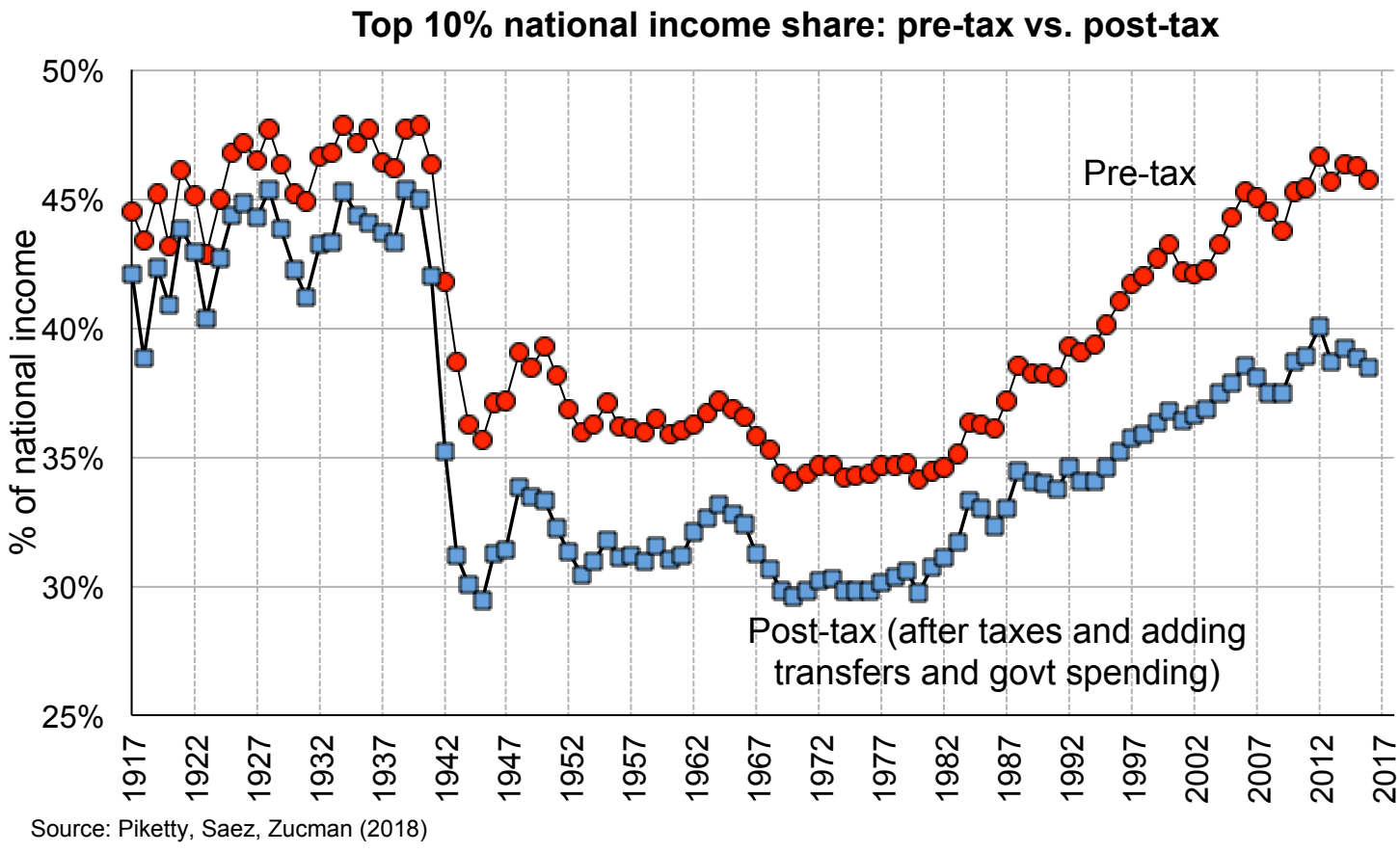
Pre-tax income is income before taxes and transfers

Post-tax income is income net of all taxes and adding all transfers and public good spending

Both concepts add up to national income and provide a comprehensive view of the mechanical impact of government redistribution

National Income Distribution 2014 from Piketty, Saez, and Zucman NBER '16

		Pre-tax income		Post-tax income	
Income group	**Number of adults**	**Average income**	**Income share**	**Average income**	**Income share**
Full Population	234,400,000	$64,600	100%	$64,600	100%
Bottom 50%	117,200,000	$16,200	12.5%	$25,000	19.4%
Middle 40%	93,760,000	$65,400	40.5%	$67,200	41.6%
Top 10%	23,440,000	$304,000	47.0%	$252,000	39.0%
Top 1%	2,344,000	$1,300,000	20.2%	$1,010,000	15.6%
Top 0.1%	234,400	$6,000,000	9.3%	$4,400,000	6.8%
Top 0.01%	23,440	$28,100,000	4.4%	$20,300,000	3.1%
Top 0.001%	2,344	$122,000,000	1.9%	$88,700,000	1.4%



Source: Piketty, Saez, Zucman (2018)

US tax/transfer System: Progressivity and Evolution

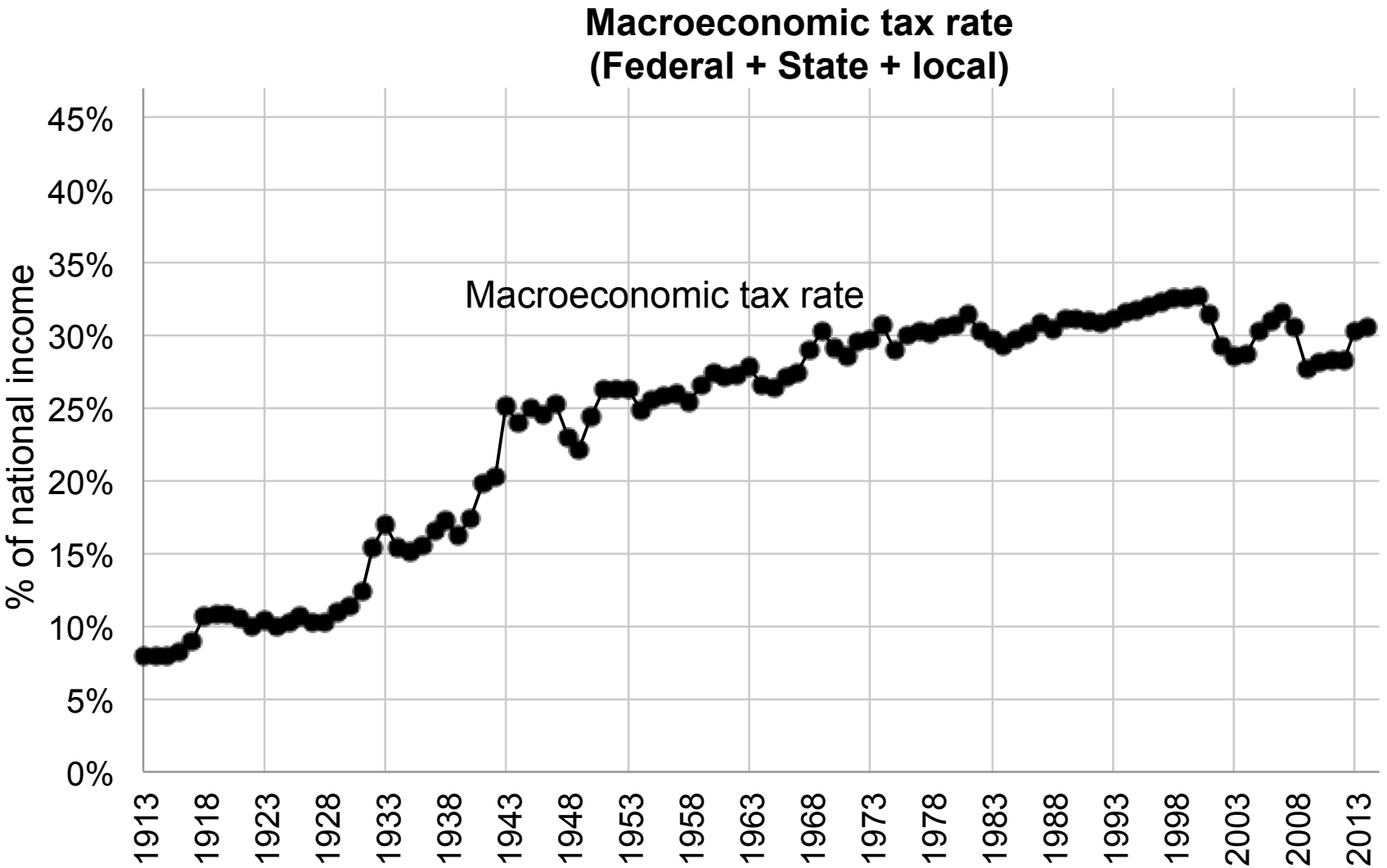
0) US Tax/Transfer system is progressive overall: pre-tax national income is less equally distributed than post-tax/post-transfer national income

1) Medium Term Changes: Federal Tax Progressivity has declined since 1970 but govt redistribution through transfers has increased (Medicaid, Social Security retirement, DI, UI various income support programs)

2) Long Term Changes: Before 1913, US taxes were primarily tariffs, excises, and real estate property taxes [slightly regressive], minimal welfare state (and hence small govt)

http://www.treasury.gov/education/fact-sheets/taxes/ustax.shtml

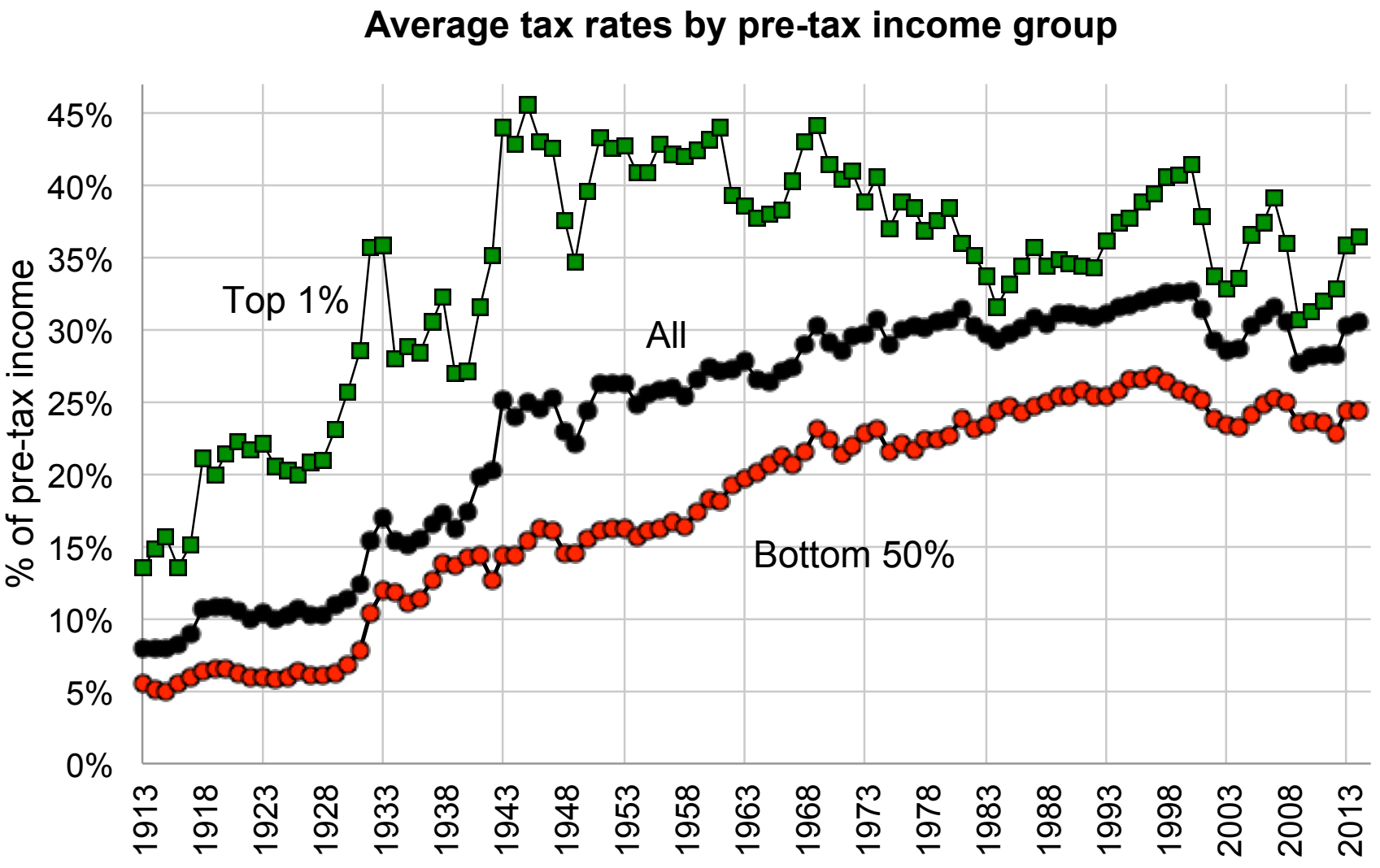
The macro rate of tax rose until the 1960s and has been constant since then



Source: Appendix Table II-G1.

Source: Piketty, Saez, Zucman (2016)

Tax progressivity has declined since the 1960s



Source: Appendix Table II-G1.

Source: Piketty, Saez, Zucman (2016)

Federal US Tax System: Overview

1) Individual income tax (on both labor+capital income) [progressive](40% of fed tax revenue)

2) Payroll taxes (on labor income) financing social security programs [about neutral] (40% of revenue)

3) Corporate income tax (on capital income) [progressive if incidence on capital income] (15% of revenue)

4) Estate taxes (on capital income) [very progressive] (1% of revenue)

5) Minor excise taxes (on consumption) [regressive] (3% of revenue)

Fed agencies (CBO, Treasury, Joint Committee on Taxation) and think-tanks (Tax Policy Center) provide distributional Fed tax tables

State+Local Tax System: Overview

Decentralized governments can experiment, be tailored to local views, create tax competition and make redistribution harder (famous Tiebout 1956 model) hence favored by conservatives

1) Individual + Corporate income taxes [progressive] (1/3 of state+local tax revenue)

2) Sales taxes + Excise taxes (tax on consumption) [regressive] (1/3 of revenue)

3) Real estate property taxes (on capital income) [slightly progressive] (1/3 of revenue)

See ITEP (2018) "Who Pays" for systematic state level distributional tax tables

US Census provides Census of Government data

TAXATION AND REDISTRIBUTION

Key question: Should government reduce inequality using taxes and transfers?

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

2) This revenue funds **transfer** programs:

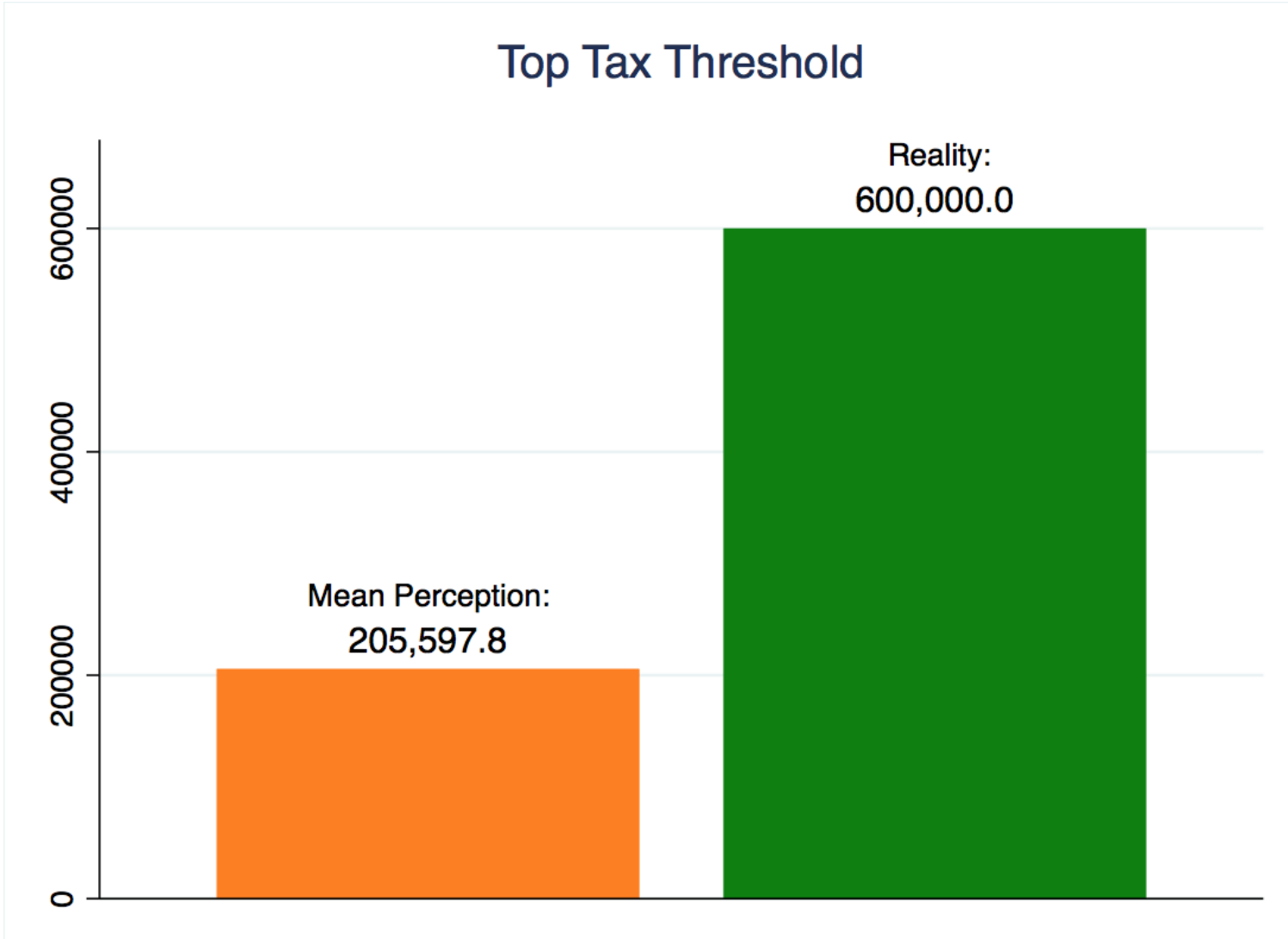
a) Universal Transfers: Education, Health Care (only 65+ in the US), Retirement and Disability

b) Means-tested Transfers: 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

This lecture follows Piketty and Saez '13 **handbook chapter**

Don't Be Like This: Perception vs. Reality



GOAL: TAKE A LOOK AT ACTUAL TAX SYSTEM

Sometimes you are an optimal tax theorist and don't know the actual top tax rates – it's weird.

You need to know institutional details. It's not boring. It's crucial.

You should not try to capture all institutional details in your models. But unless you know them, you cannot argue they are second-order.
(Sometimes the devil is in the detail, sometimes not).

The tax system reflects

i) social judgements made by people and policy makers and

ii) lobbying, political economy, interest groups.

Understand the implicit social judgements behind the tax system.

Question them! Which constraints are truly "irremovable"?

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 factor national income

FEDERAL US INCOME TAX

Taxable income = AGI - deductions

deduction is max of standard deduction or itemized deductions

Standard deduction is a fixed amount ($12K for singles, $24K for married couple)

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

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

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

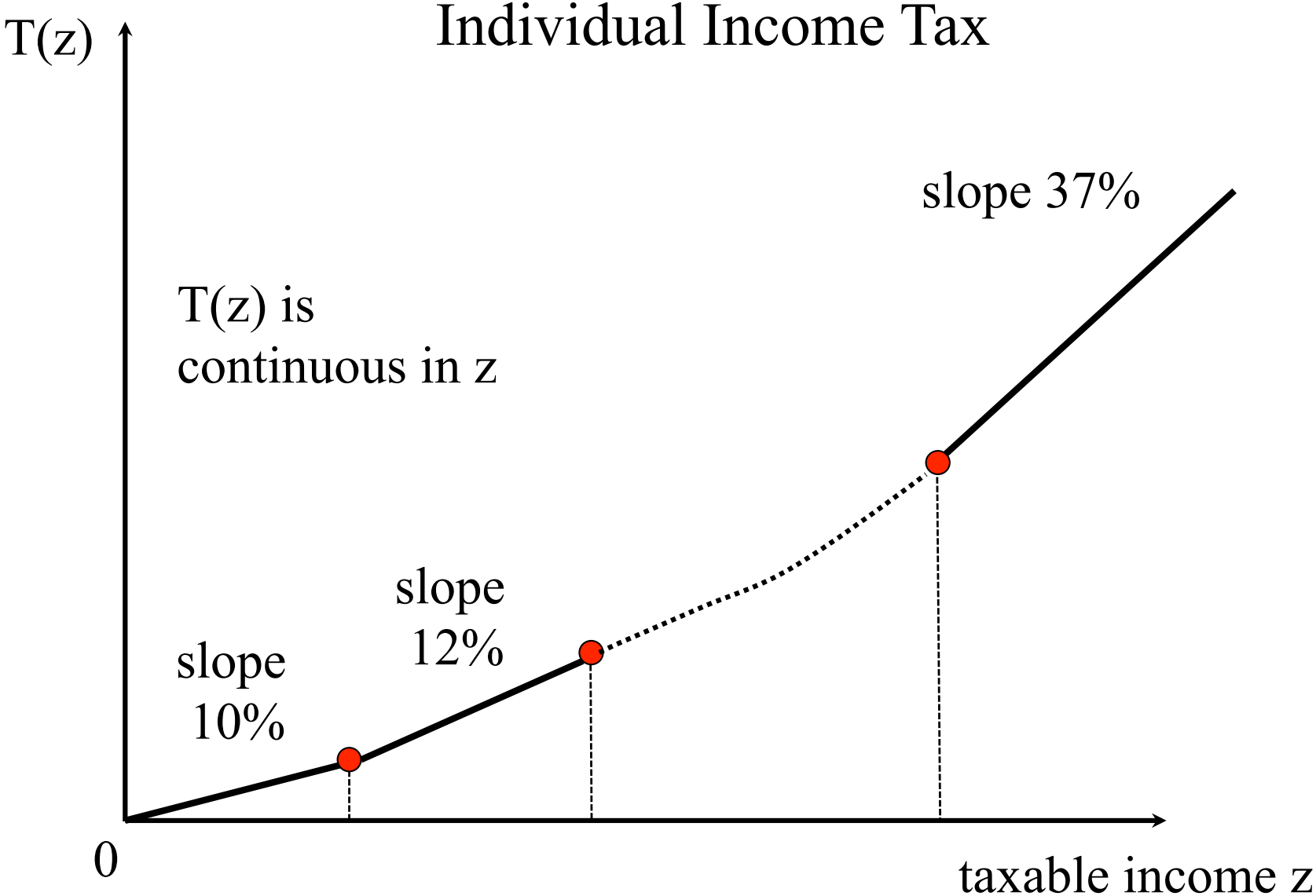
In 2018+, 6 brackets with MTR 10%,12%,22%,24%,32%,35%, 37% (top bracket for z above \$600K), indexed on price inflation

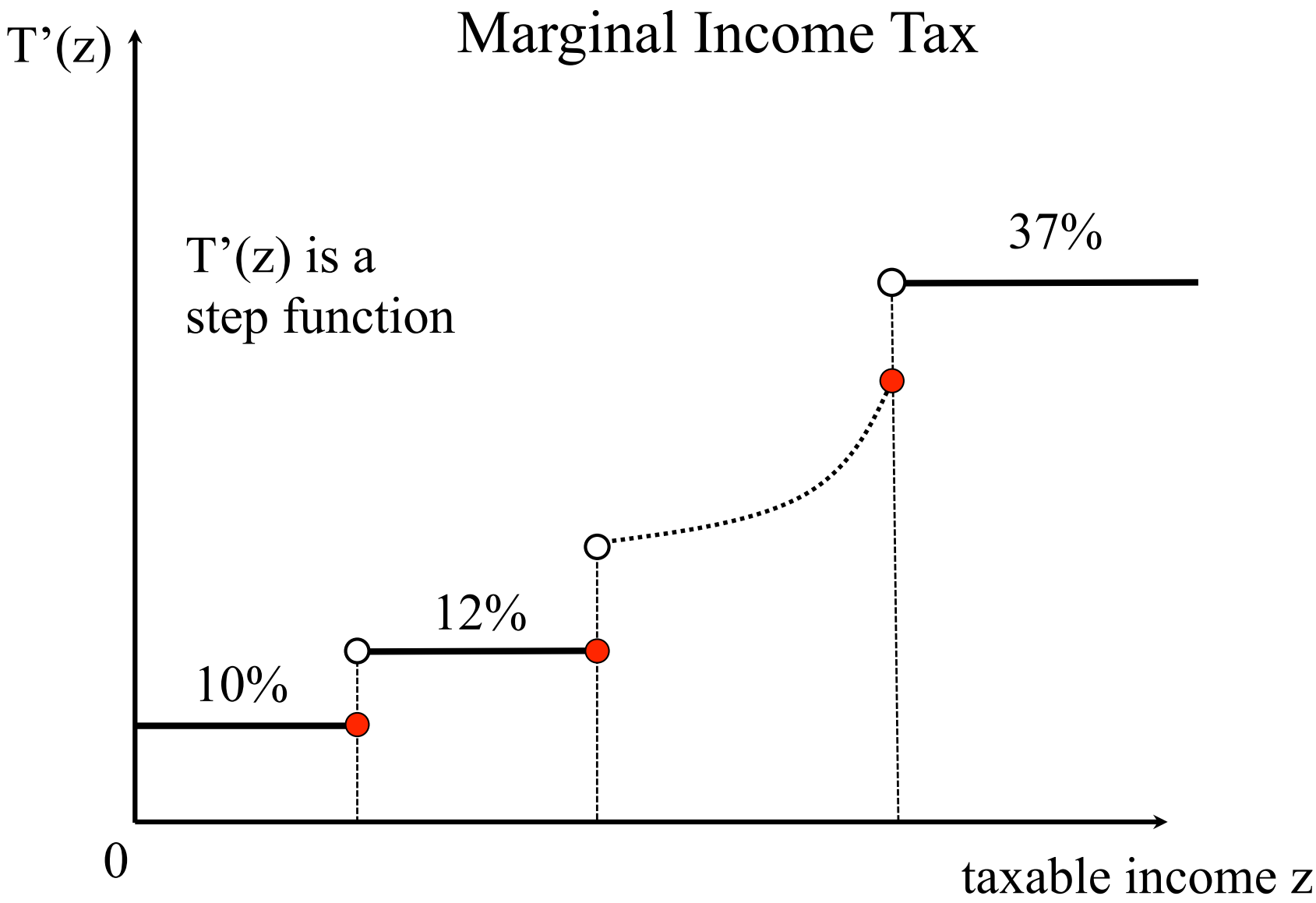
Lower preferential rates (up to a max of 20%) apply to dividends (since 2003), realized capital gains [in part to offset double taxation of corporate profits].

20% of business profits 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
T'(z)
T'(z) is a
step function
37%
12%
10%
0
taxable income z

In practice...

Form **1040** U.S. Individual Income Tax Return **2010** (99) IRS Use Only - Do not write or staple in this space.

OMB No. 1545-0074

For the year Jan. 1-Dec. 31, 2010, or other tax year beginning , 2010, ending , 20

Name, Address, and SSN

PRINT CLEARLY

Your first name and initial	Last name	Your social security number
BARACK H.	OBAMA	
If a joint return, spouse's first name and initial	Last name	Spouse's social security number
MICHELLE L.	OBAMA	
Home address (number and street). If you have a P.O. box, see instructions.	Apt. no.	Make sure the SSN(s) above and on line 6c are correct.
1600 PENNSYLVANIA AVENUE, NW		
City, town or post office, state, and ZIP code.		Checking a box below will not change your tax or refund.
WASHINGTON, DC 20500		

See separate instructions.

Presidential Election Campaign ▶ Check here if you, or your spouse if filing jointly, want $3 to go to this fund ▶ [X] You [X] Spouse

Filing Status Check only one box.

1 [ ] Single
2 [X] Married filing jointly (even if only one had income)
3 [ ] Married filing separately. Enter spouse's SSN above and full name here. ▶
4 [ ] Head of household (with qualifying person). If the qualifying person is a child but not your dependent, enter this child's name here. ▶
5 [ ] Qualifying widow(er) with dependent child

Exemptions

6a [X] Yourself. If someone can claim you as a dependent, do not check box 6a
b [X] Spouse
Boxes checked on 6a and 6b: 2

c Dependents:

(1) First name Last name	(2) Dependent's social security number	(3) Dependent's relationship to you	(4) ✓ if child under age 17 qualifying for child tax credit
MALIA A OBAMA		DAUGHTER	X
NATASHA M OBAMA		DAUGHTER	X

No. of children on 6c who:
- lived with you: 2
- did not live with you due to divorce or separation (see instructions):

Dependents on 6c not entered above:

If more than four dependents, see instructions and check here ▶ [ ]

d Total number of exemptions claimed: Add numbers on lines above ▶ 4

Income

Attach Form(s) W-2 here. Also attach Forms W-2G and 1099-R if tax was withheld.

7	Wages, salaries, tips, etc. Attach Form(s) W-2	7	395,188.
8a	Taxable interest. Attach Schedule B if required	8a	8,066.
b	Tax-exempt interest. Do not include on line 8a (8b)		
9a	Ordinary dividends. Attach Schedule B if required	9a	9,997.
b	Qualified dividends (9b) 2,159.		
10	Taxable refunds, credits, or offsets of state and local income taxes STMT 2 STMT 3	10	1,151.
11	Alimony received	11	
12	Business income or (loss). Attach Schedule C or C-EZ	12	1,382,889.
13	Capital gain or (loss). Attach Schedule D if required. If not required, check here ▶ [ ]	13	-3,000.

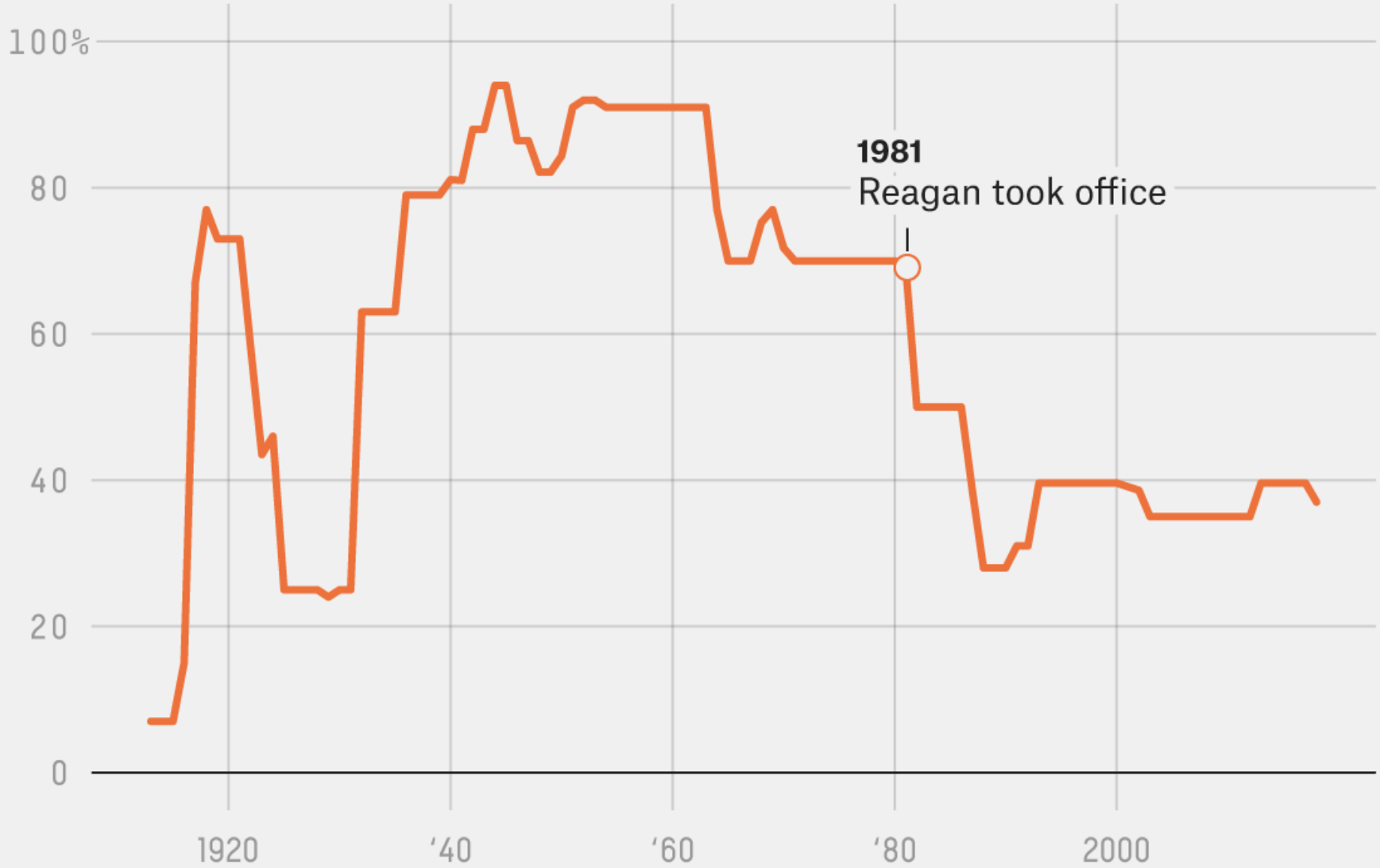
If you did not get a W-2,

2018 US Personal Income Tax Code

Rate	Individuals	Married Filing Jointly
10%	Up to $9,525	Up to $19,050
12%	$9,526 to $38,700	$19,051 to $77,400
22%	$38,701 to $82,500	$77,401 to $165,000
24%	$82,501 to $157,500	$165,001 to $315,000
32%	$157,501 to $200,000	$315,001 to $400,000
35%	$200,001 to $500,000	$400,001 to $600,000
37%	over $500,000	over $600,000

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: AMT AND CREDITS

Alternative minimum tax (AMT) is a parallel tax system (quasi flat tax at 28%) with fewer deductions: actual tax $=\max(T(z), AMT)$ (hits $< 1\%$ of taxpayers in 2018+)

Tax credits: Additional reduction in taxes

(1) **Non refundable** (cannot reduce taxes below zero): foreign tax credit, child care expenses, education credits, energy credits

(2) **Refundable** (can reduce taxes below zero, i.e., be net transfers): EITC (earned income tax credit, up to \$3.5K, \$5.7K, \$6.5K for working families with 1, 2, 3+ kids), Child Tax Credit (\$2K per kid, partly refundable)

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, huge private industry]

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

Payers (employers, banks, etc.) send income information to IRS (US tax administration) (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

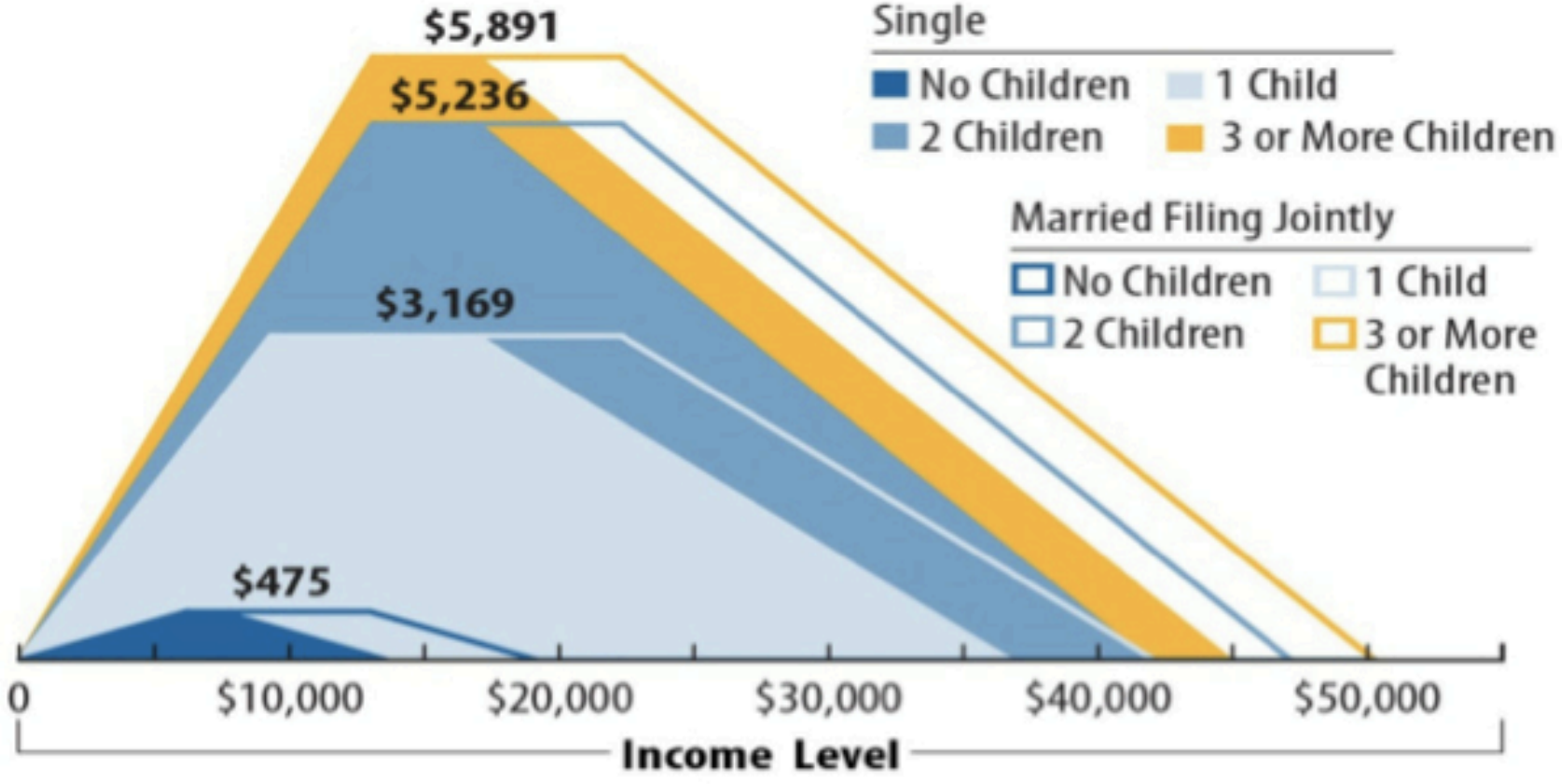
Main programs: Medicaid (health insurance for low incomes), SNAP (former food stamps), public housing, TANF (traditional welfare), SSI (aged+disabled)

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

Figure 1

EITC refunds by family size and income (CBPP 2013)



Source: Center on Budget and Policy Priorities.

BOTTOM LINE ON ACTUAL TAXES/TRANSFERS

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

2) Some allowances made to reward / encourage certain behaviors: charitable giving, home ownership, savings, energy conservation, and more recently work (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

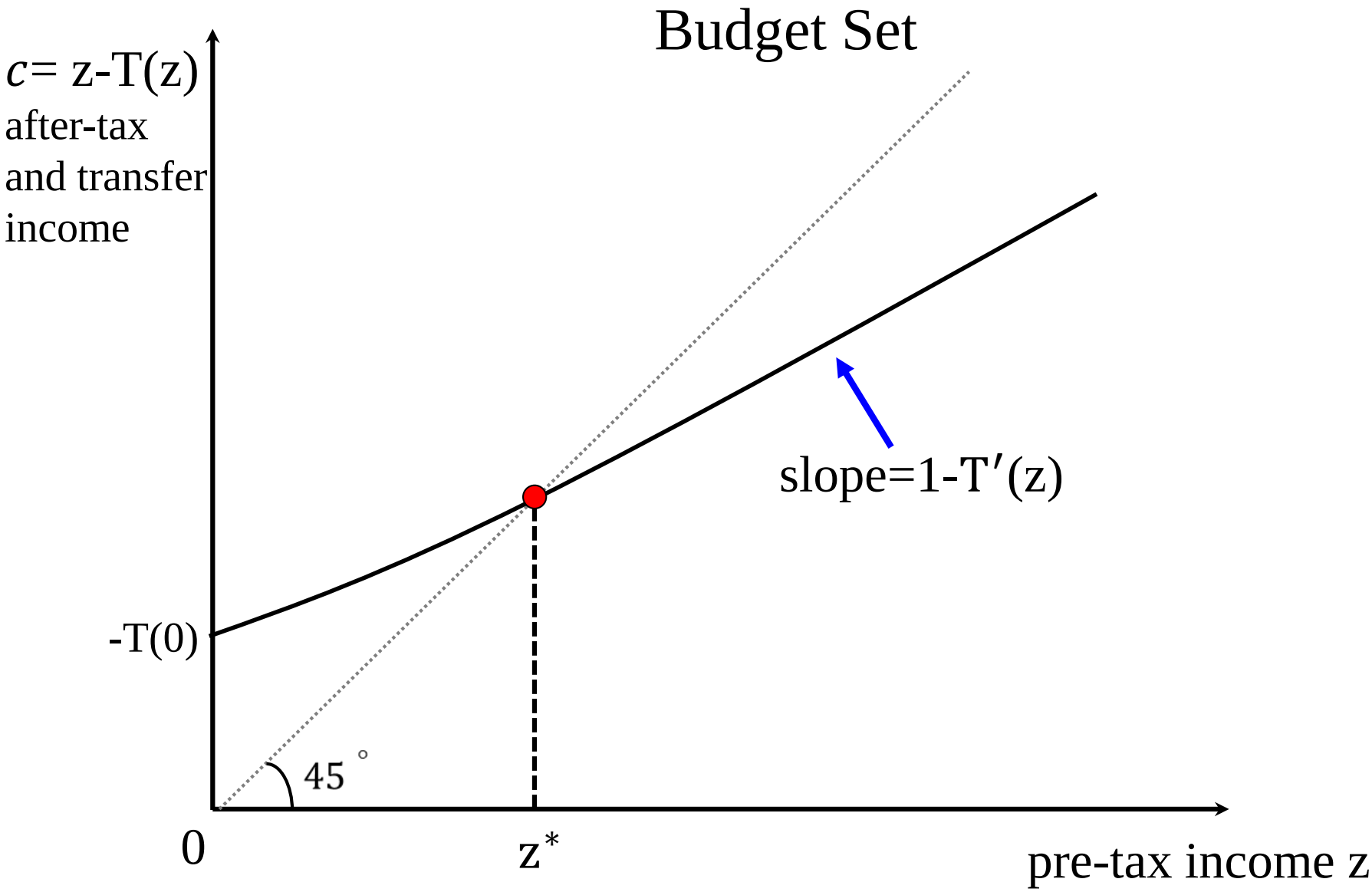
1) Transfer benefit with zero earnings $-T(0)$ [sometimes called demogrant or lumpsum grant]

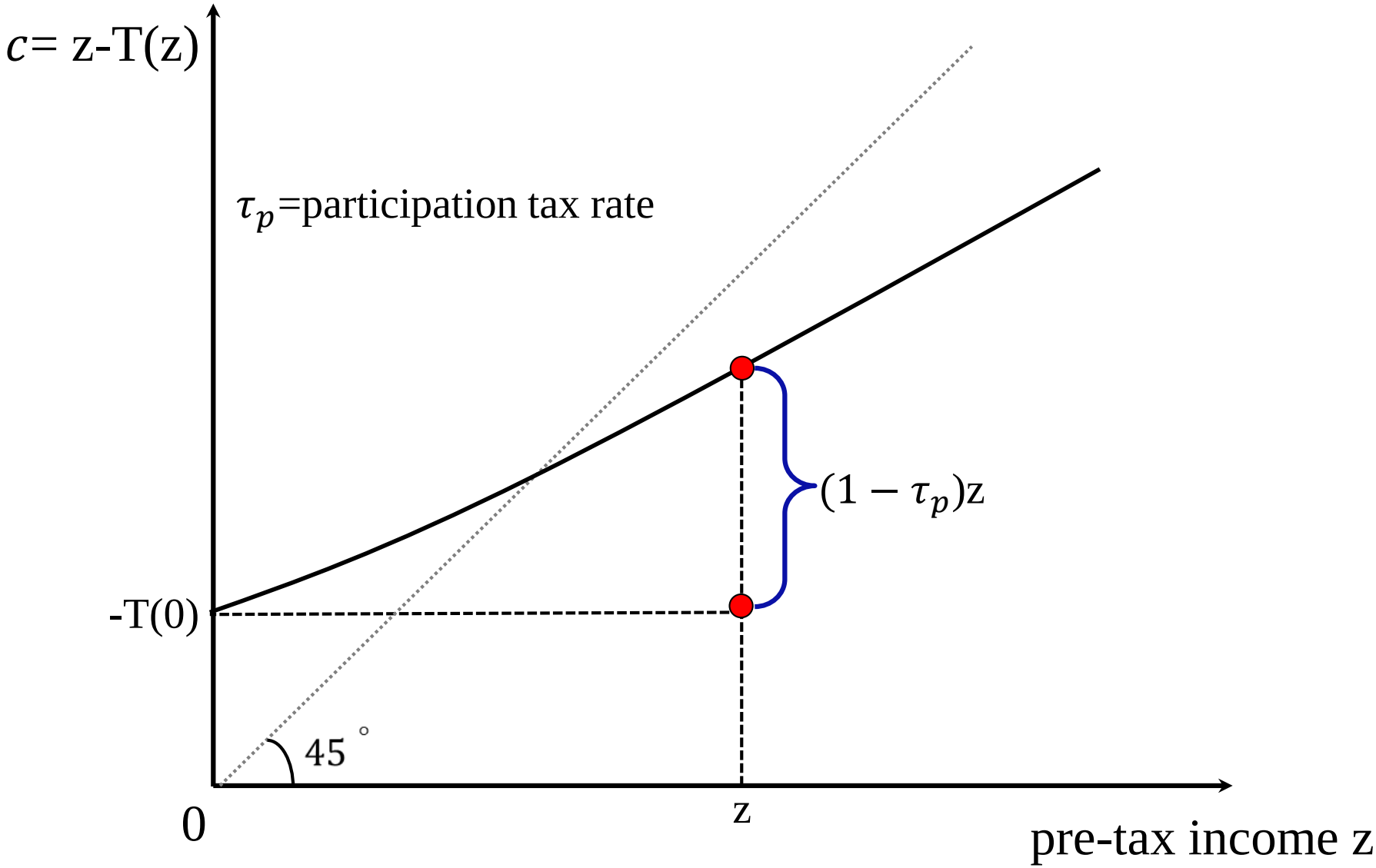
2) Marginal tax rate (or phasing-out rate) $T'(z)$: individual keeps $1 - T'(z)$ for an additional \$1 of earnings (intensive labor supply response)

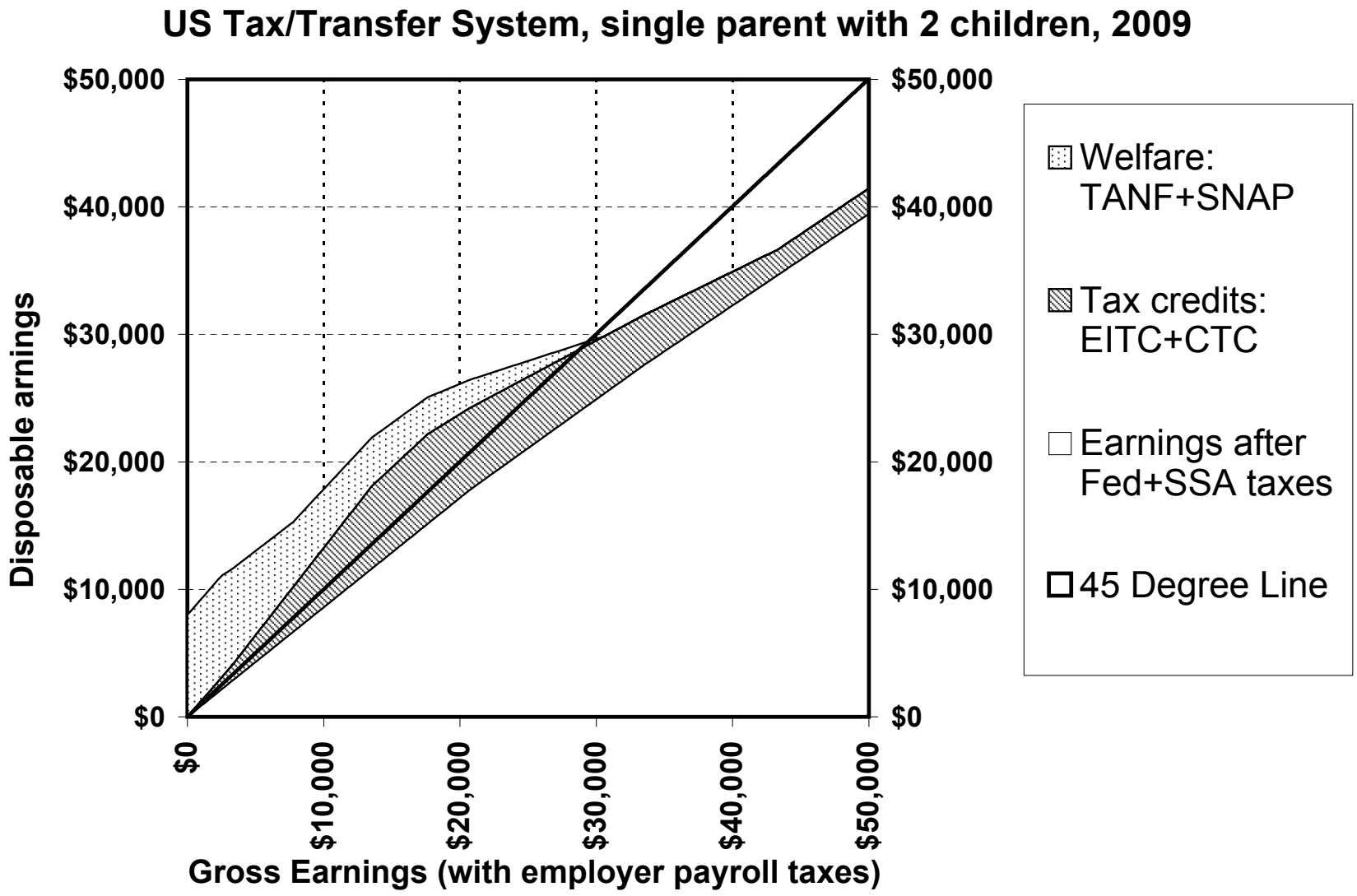
3) Participation tax rate $\tau_p = [T(z) - T(0)]/z$: individual keeps fraction $1 - \tau_p$ of earnings when moving from zero earnings to earnings z (extensive labor supply response):

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

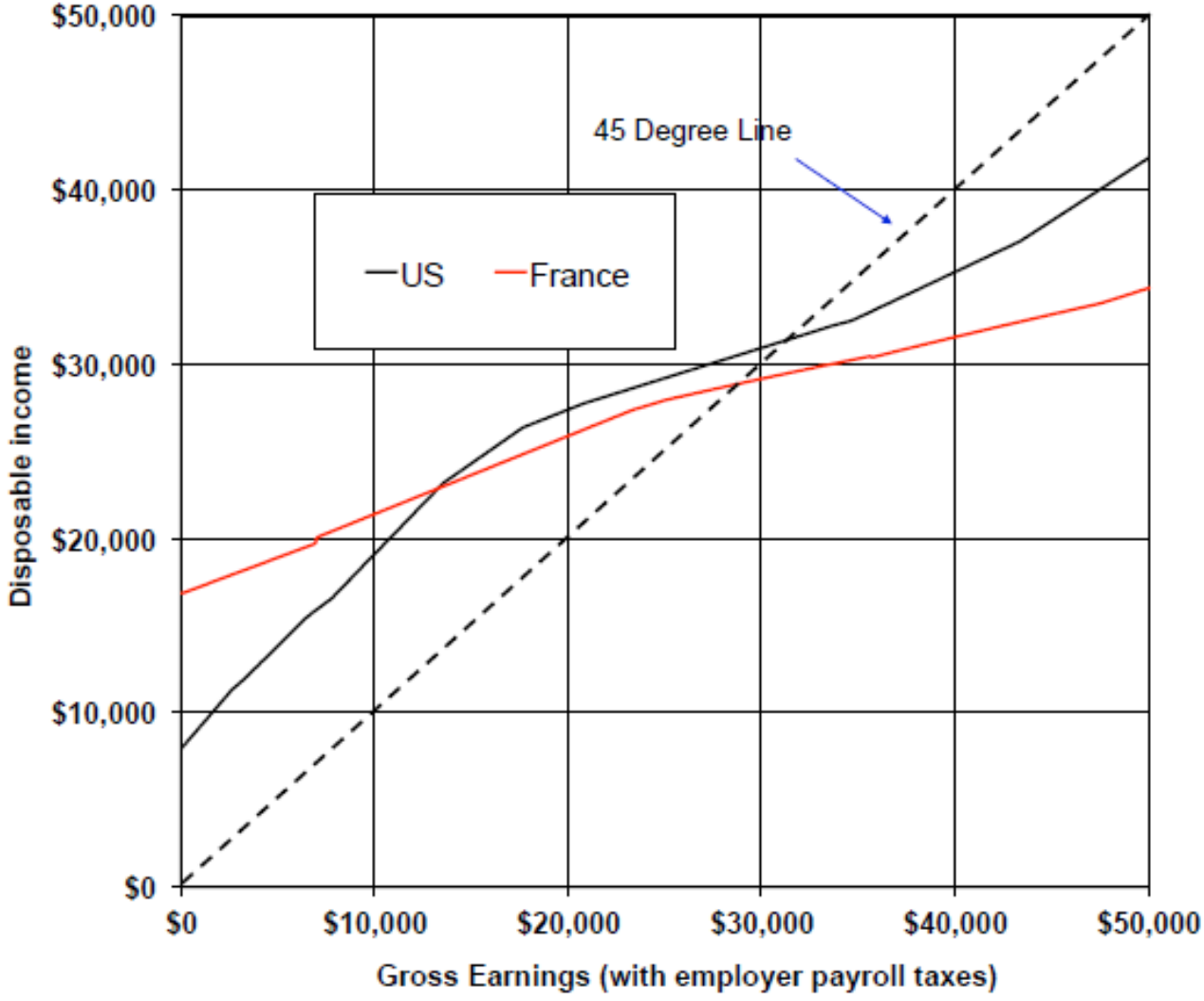
4) Break-even earnings point z^*: point at which $T(z^*) = 0$


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

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) Children create externalities [positive: pay-as-you-go retirement programs, negative: global warming]. If fertility responds to transfers, case for subsidizing/taxing children

5) 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)

CHILDREN AND LIMITS OF UTILITARIAN MODEL

If fertility decisions unrelated to children tax/transfers $\Rightarrow$ Social marginal utility should be equated across families with 0 children, families with 1 child, etc.

If ability uncorrelated with children $\Rightarrow$ Families with kids will get fully compensating transfers

If ability positively correlated with children $\Rightarrow$ Families with kids might be taxed more heavily [as in the height tax case]

Seems an absurd model to think about transfers for children $\Rightarrow$ Need to come up with more realistic alternative

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