Historically, a 70 percent marginal tax rate is not unusual
The top marginal income tax rates from 1913 to 2018

1981
Reagan took office

SOURCE: TAX POLICY CENTER
Source: Computations made by Emmanuel Saez using tax and transfer system parameters
Source: Piketty, Thomas, and Emmanuel Saez (2012)
21.1 Basic Theory

Consumption

Leisure hours

Indifference curve, $IC_1$

slope = -12.50

slope = -8.75

$C_1 = \$13,750$

$C_2 = \$9,625$

$A$

$BC_1$

$BC_2$

0 900
21.1 Substitution versus Income Effect

(a) Substitution effect is larger

(b) Income effect is larger

Consumption

Leisure hours

$13,750

7,000

0

900

1,200

IC1

IC2

BC2

BC1

A

B

C

$13,750

12,250

0

600

900

IC1

IC3

BC2

BC1

A

C

Substitution

versus

Income

Effect
The Laffer Curve

![Laffer Curve Diagram]

- Tax revenues
- "Correct side"
- "Wrong side"
- $\tau^*$
- 0
- 100%
- Tax rate

---

Optimal Top Income Tax Rate (Mirrlees ’71 model)

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

Market income \( z \)

Top bracket:
Slope 1-\( \tau \)

Reform:
Slope 1-\( \tau - d\tau \)

Source: Diamond and Saez JEP'11
Optimal Top Income Tax Rate (Mirrlees ’71 model)

Disposable Income
\[ c = z - T(z) \]

Market income \( z \)

\[ z^* - T(z^*) \]

Mechanical tax increase:
\[ d\tau [z - z^*] \]

Behavioral Response tax loss:
\[ \tau \, dz = - d\tau \, e^z \, \tau / (1 - \tau) \]

Source: Diamond and Saez JEP’11
Empirical Pareto Coefficient

\[ a = \frac{z_m}{z_m - z^*} \] with \[ z_m = E(z|z > z^*) \]

\[ \alpha = \frac{z^* h(z^*)}{1 - H(z^*)} \]

Source: Diamond and Saez JEP'11
Starting from a Means-Tested Program

Consumption \( c \)

Earnings \( w \)

Source: revised version of Saez (2002), p. 1050
Introducing a small EITC is desirable for redistribution

Starting from a Means-Tested Program

Introducing a small EITC is desirable for redistribution

Source: revised version of Saez (2002), p. 1050
Starting from a Means-Tested Program

Introducing a small EITC is desirable for redistribution

Participation response saves government revenue

Source: revised version of Saez (2002), p. 1050
EITC Amount as a Function of Earnings

Earnings ($)

0 5000 10000 15000 20000 25000 30000 35000 40000

Subsidy: 34%
Phase-out tax: 16%

Single, 2+ kids
Married, 2+ kids
Single, 1 kid
Married, 1 kid
No kids

EITC Amount ($)
0 1000 2000 3000 4000

Source: Federal Govt
The Phase-In and Phaseout of the EITC

Credit Amount by Marital Status and Number of Children

Individual Income Tax

$T(z)$ is continuous in $z$.

- Slope 10%
- Slope 12%
- Slope 37%
Marginal Income Tax

$T'(z)$ is a step function

10%

12%

37%

0

taxable income $z$
Budget Set

$c = z - T(z)$

after-tax and transfer income

slope = 1 - $T'(z)$
\[ c = z - T(z) \]

\[ \tau_p = \text{participation tax rate} \]

\[ (1 - \tau_p)z \]
Laffer Curve

\[ R = \tau \cdot Z(1 - \tau) \]

\[ \tau^* = \frac{1}{1 + e} \text{ with } e = \frac{1-\tau}{Z} \cdot \frac{dZ}{d(1-\tau)} \]
Utilitarianism and Redistribution

$u \left( \frac{c_1 + c_2}{2} \right)$

$u(c_1) + u(c_2) \frac{2}{2}$

utility

consumption $c$

$0 \quad c_1 \quad \frac{c_1 + c_2}{2} \quad c_2$
Effect of Tax on Labor Supply

\( c = z - T(z) \)

- \( T(z) < 0 \): income effect \( z \downarrow \)
- \( T'(z) > 0 \): substitution effect \( z \downarrow \)
- \( T(z) > 0 \): income effect \( z \uparrow \)
- \( T'(z) > 0 \): substitution effect \( z \downarrow \)

slope = 1 - T'(z)
Labor Supply Theory

Indifference Curves

Budget: $c = wl + R$

Marshallian Labor Supply $l(w,R)$

$c = z - T(z)$

Consumption

$l = labor supply$
Minimize cost to reach utility $u$ given slope $w$: Hicksian Labor Supply $l^c(w,u)$.
Labor Supply Income Effect

\[ c = z - T(z) \]

consumption

Budget: \[ c = wl + R \]

\[ l(w, R) \]
Labor Supply Income Effect

Budget: $c = wI + R + dR$

Budget: $c = wI + R$

$c = z - T(z)$

consumption

labor supply $l$
Labor Supply Income Effect

\[ l(w, R) \]

\[ l(w, R+dR) \]

\[ \eta = w \frac{\partial l}{\partial R} < 0 \]

Budget: \[ c = wl + R + dR \]

Budget: \[ c = wl + R \]

\[ c = z - T(z) \] consumption

Labor supply l
Labor Supply Substitution Effect

c = z - T(z)

consumption

utility $u$

Slope = $w$

$l^c(w, u)$
Labor Supply Substitution Effect

\[ c = z - T(z) \]

consumption

\[ \text{utility } u \]

\[ \text{slope} = w + dw \]

\[ \varepsilon^c = \left( \frac{w}{l^c} \right) \frac{\partial l^c}{\partial w} > 0 \]

\[ l^c(w, u) \]

\[ l^c(w + dw, u) \]

Labor supply \( l \)
Uncompensated Labor Supply Effect

Budget: $c = wl + R$

$\text{c=z-T(z)}$

Consumption

Labor supply $l$

Slope = w
Uncompensated Labor Supply Effect

\[ c = z - T(z) \]

consumption

\[ l(w,R) \quad l(w+dw,R) \]

Labor supply \( l \)

\[ \varepsilon^u \]

slope = \( w + dw \)

slope = \( w \)
Uncompensated Labor Supply Effect

\[ c = z - T(z) \]

consumption

\[ \varepsilon^u > 0 \]

substitution effect

\[ \text{slope} = w + dw \]

\[ \text{slope} = w \]

Labor supply \( l \)
Uncompensated Labor Supply Effect

Slutsky equation: \( \varepsilon^u = \varepsilon^c + \eta \)

- Income effect: \( \eta \leq 0 \)
- Substitution effect: \( \varepsilon^c > 0 \)

c = z - T(z)  

Consumption

Labor supply l

slope = w

slope = w + dw
Basic income vs. Means-tested transfer

Basic income: give R to all, Tax all earnings z at MTR $\tau$

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

Budget: $c = (1-\tau) z + R$

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

slope $= 1-\tau$
Effect of Taxes/Transfers on Labor Supply

\[ c = z - T(z) \]

- **Disposable income**

\[ T(z) < 0: \] income effect: \( z \) decreases

\[ T'(z) > 0: \] substitution effect: \( z \) decreases

Net effect: \( z \) decreases

\[ T(z) > 0: \] income effect: \( z \) increases

\[ T'(z) > 0: \] substitution effect: \( z \) decreases

Net effect on \( z \) is ambiguous

Slope: \( 1 - T'(z) \)

45°
Effect of Taxes/Transfers on Labor Supply

c = z - T(z)  
disposable income

slope = 1 - T'(z)

z^*

pre-tax earnings z
Effect of Taxes/Transfers on Labor Supply

\( c = z - T(z) \)

disposable income

\( T(z) < 0: \) income effect: \( z \) decreases

\( T'(z) > 0: \) substitution effect: \( z \) decreases

Net effect: \( z \) decreases

Effect of Taxes/Transfers on Labor Supply \((z < z^*)\)

\( \text{slope} = 1 - T'(z) \)
Effect of Taxes/Transfers on Labor Supply

\[ z > z^* \]

\[ c = z - T(z) \]

disposable income

pre-tax earnings \( z \)

\[ -T(0) \]

\[ 45^\circ \]

\( T(z) > 0 \): income effect: \( z \) increases

\( T'(z) > 0 \): substitution effect: \( z \) decreases

Net effect on \( z \) is ambiguous

slope = 1 - \( T'(z) \)
Starting from a Means-Tested Program

Disposable income
c = z - T(z)

Pre-tax earnings z

G

45°

w*
Introducing a small EITC is desirable for redistribution if $1 to low paid workers more valued than $1 distributed to all.
Introducing a small EITC is desirable for redistribution.

Participation response saves government revenue.

\[ c = z - T(z) \]
Introducing a small EITC is desirable for redistribution

Participation response saves government revenue

Win-Win reform

Disposable income $c = z - T(z)$
Introducing a small EITC is desirable for redistribution. Starting from a Means-Tested Program, participation response saves government revenue. Win-Win reform: if intensive response is small.
Starting from a means-tested program

Disposable income
\[ c = z - T(z) \]

Pre-tax earnings \( z \)

\[ 0 \]

\[ z^* \]

\[ 45^\circ \]
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
Means-tested Transfers in the US, 1960-2019

- health
- housing
- children in-kind
- children cash
- elderly/disabled
- general

FIGURE 1
Child Tax Credit, Single Parent
For one child, tax year 2020

Notes: Assumes all income comes from earnings, and child meets all tests to be a CTC-qualifying dependent. Credit for married parents begins to phase out at $400,000 of income. Only citizen children qualify for the $2,000 CTC for children under 17. Noncitizens under age 17 who meet the dependency tests of eligibility can qualify for the credit for dependents over age 17.
Optimal Tax/Transfer Systems

No taxes/transfers

Optimal tax system with no behavioral responses: 100% redistribution
Optimal Tax/Transfer Systems

- $z - T(z)$:
  - after-tax and transfer income

- $-T(0)$

- No taxes/transfers

- Optimal tax system with behavioral responses

- Optimal tax system with no behavioral responses: 100% redistribution

Graph showing various tax and transfer systems and their impacts on after-tax income.
FIGURE 1
Child Tax Credit, Single Parent
For one child, tax year 2021

- Credit for children ages 0–5
- Credit for children ages 6–17
- Prior law credit for children ages 0–16
- Credit for other dependents

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.