



UNIVERSITY OF
OXFORD

The BIG cost confusion

Andrew Saxe

Joint work with Liz Fouksman

University of Oxford

Outline

- Gross vs net costs
- Marginal tax rates vs Average tax rates
- Universal basic income vs Negative income tax
 - Economic cost
 - Psychological cost
 - Political intuitions/imagination
- The real debate: different policies
- Suggestions for communicating cost

An oft-repeated point

- Most of what I'll say has been said (probably better) by others
- James Tobin
- Guy Standing
- Philippe Van Parijs
- Gregory Mankiw
- Scott Santens
- Liz Fouksman
- ...

What cost is costly?

- Something is costly if it reduces your disposable income

- Ex. 1: If you pay me \$100 and I pay you \$100, this is not costly Net: 0 Gross: 100
- Ex. 2: If you pay me \$100 this costs you \$100 Net: 100 Gross: 100
- Ex. 3: If you pay me \$100 and I pay you \$80, this costs you \$20 Net: 20 Gross: 100

- A change in disposable income impacts your opportunities for exchange in the market
- Does this correspond to net or gross cost? Net.

Net cost is what matters: Only net cost is genuinely 'costly'

Net vs gross cost: what does 'cost' mean?

- Thought experiment:
 - Buy a carton of milk
 - Pay with a \$20 bill
 - Get \$15 in change
- How much did the milk cost? \$5
- Using the procedures often used to cost UBI proposals, they would say the milk costs \$20
- UBI equivalent:
 - Pay \$20 in taxes
 - Get \$15 in UBI
- Net cost: \$5

Net vs gross cost: social policies

- The net cost is the amount of money lost by one group of people and gained by another *after all transfers*.
- It transparently measures the amount of redistribution
- The net and gross costs of UBI can be very different!
 - Ex: You get a \$12000 UBI, and pay \$15000 in taxes. The net cost to you is \$3000.

Net cost and the UBI

- To understand the cost of UBI, must account for the fact that:

The same people who get the UBI also fund it

- The gross cost error is to calculate (UBI amount) x (# of people)
- The net cost measures how much each individual gains or loses
- To calculate net cost, we *must* specify funding

Outline

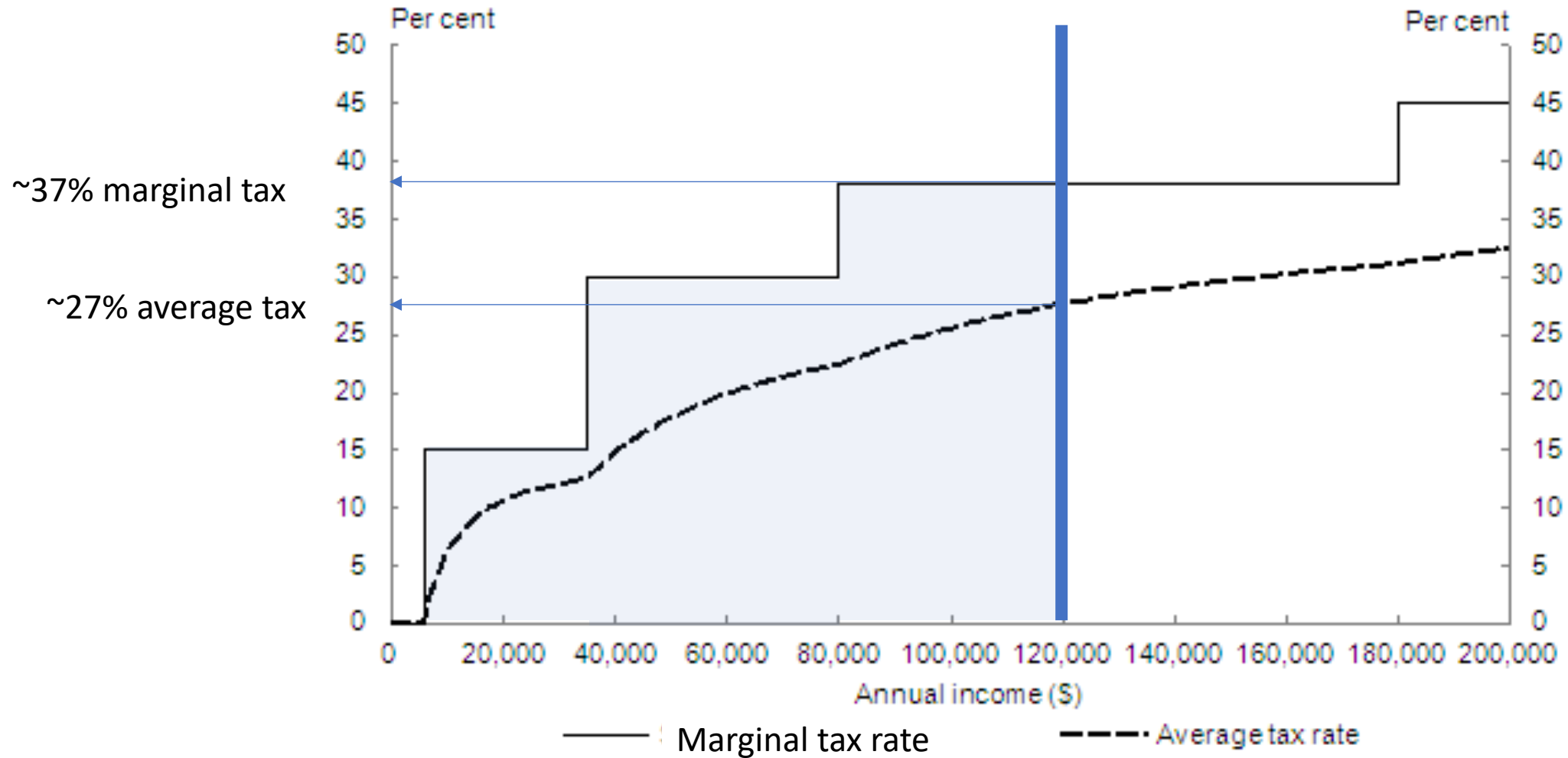
- Gross vs net costs
- Marginal tax rates vs Average tax rates
- Universal basic income vs Negative income tax
 - Economic cost
 - Psychological cost
 - Political intuitions/imagination
- The real debate: different policies
- Suggestions for communicating cost

Marginal vs Average taxes

- Suppose you are a top earner making \$1 million
- The top tax bracket in your country is %50
- How much do you pay in taxes?
- Not ½ milion!

Marginal tax rate

Suppose you earn 120k



Marginal tax rate

- For an individual with income r , what is the tax paid on one dollar of additional income?
- Definition: Marginal tax rate

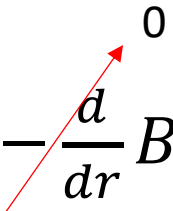
$$f(r) \approx \frac{(\text{tax paid at income } r+1) - (\text{tax paid at income } r)}{r+1 - r}$$

$$f(r) = \frac{d}{dr} \text{tax}(r)$$

Marginal tax rate

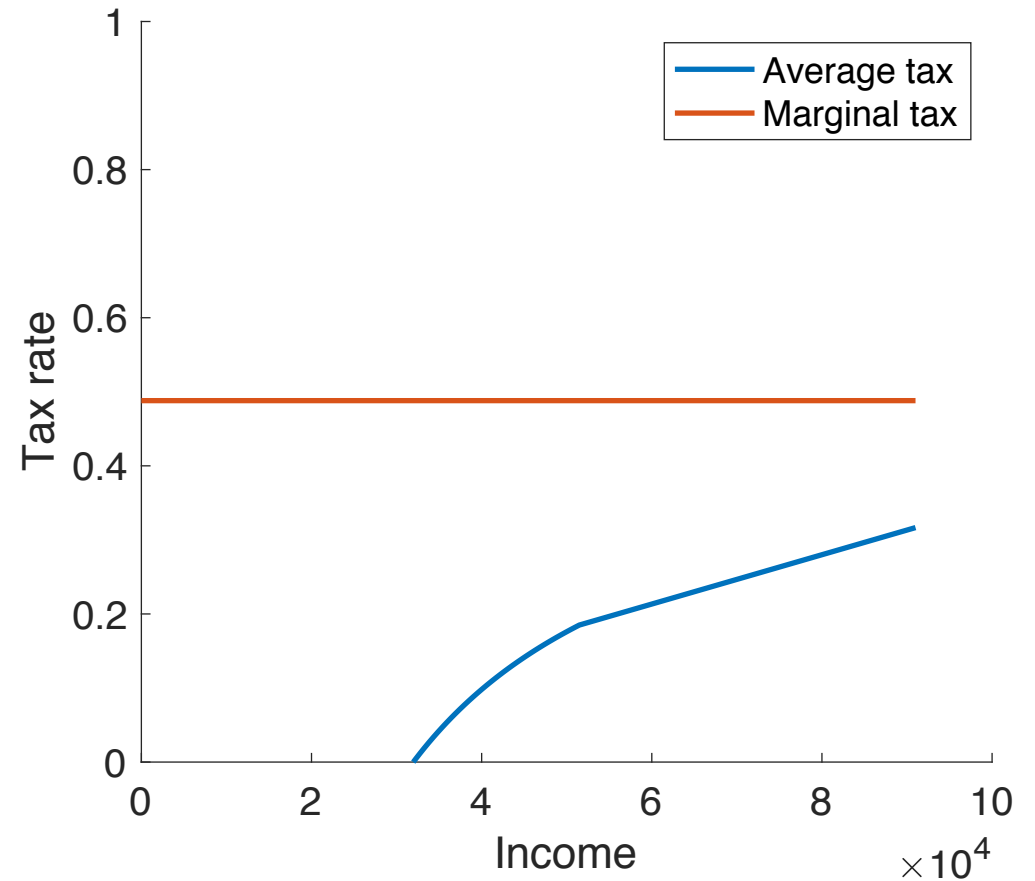
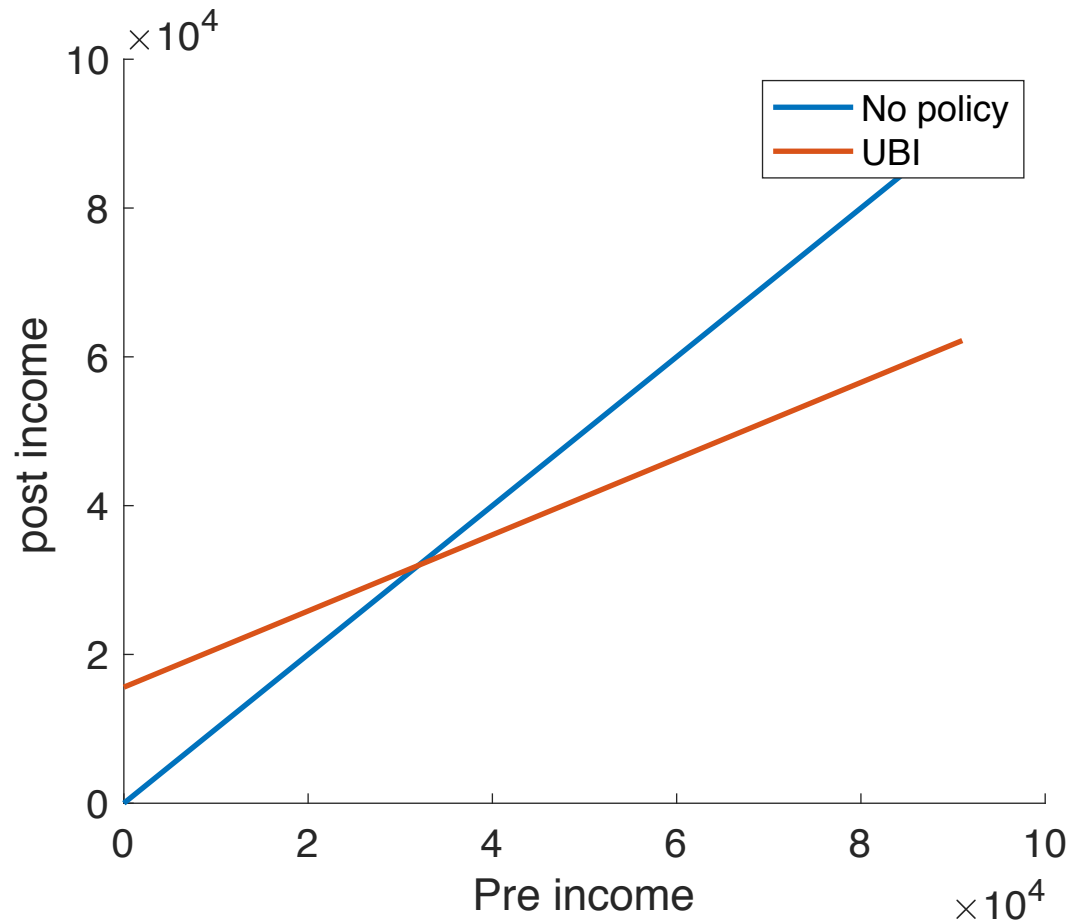
- The main conceptual hurdle: marginal tax rates *do not measure lump sum transfers*
- If you receive a UBI, your marginal tax rate can go up but your post income *can also go up* because you get a UBI which more than offsets the additional marginal tax
- Example:
 - Suppose you earn \$500 and live in a society with no taxes. You have:
 - 0 marginal tax rate
 - \$500 of income
 - Suppose you earn \$500 and live in a society with \$1000 UBI and 50%(!!!) marginal tax rates/recoupment rate
 - 50% marginal tax rate
 - $1000 + 500 * 0.5 = \$1250$ of post- income
- Your marginal tax rate increased by 50 percentage points, but you came out \$750 richer

Marginal tax rates and income-constant payments

- Recall $f(r) = \frac{d}{dr} tax(r)$
- Suppose the tax you pay includes a constant amount irrespective of income:
 - $tax(r) = -B + tax'(r)$
- The marginal tax rate is $\frac{d}{dr} tax(r) = -\cancel{\frac{d}{dr} B} + \frac{d}{dr} tax'(r) = \frac{d}{dr} tax'(r)$

- Because the derivative of a constant is zero, constant components of transfers do not affect the marginal tax

UBI example

- 15000GBP UBI, ~50% marginal tax rate



Marginal tax rates vs Average tax rates

- Marginal tax rates do not clearly reflect lump sum transfers
- Average tax rates do
- Marginal tax rates are useful for understanding work incentive

Outline

- Gross vs net costs
- Marginal tax rates vs Average tax rates
- Universal basic income vs Negative income tax
 - Economic cost
 - Psychological cost
 - Political intuitions/imagination
- The real debate: different policies
- Suggestions for communicating cost

UBI vs Negative income tax

- Population of P individuals, each with income $r_i, i = 1, \dots, P$, received in T different ways r_{it} such that $\sum_t r_{it} = r_i$
- UBI of size B funded by marginal tax rate $f(r)$ and T revenue streams with marginal rates $f_t(r)$
- Post income $\tilde{r}_i = r_i + B - \int_0^{r_i} f(r)dr - \sum_{t=1}^T \int_0^{r_{it}} f_t(r_{it})dr$
- NIT with tax function $g(r)$ and T revenue streams with tax $g_t(r)$
- Post income $\hat{r}_i = r_i - g(r_i) - \sum_{t=1}^T g_t(r_{it})$

Transfer equivalent UBI & Negative income tax

- UBI post income $\tilde{r}_i = r_i + B - \int_0^{r_i} f(r)dr - \sum_{t=1}^T \int_0^{r_{it}} f_t(r_{it})dr$
- NIT post income $\hat{r}_i = r_i - g(r_i) - \sum_{t=1}^T g_t(r_{it})$
- Result 1: For every UBI, there is an equivalent NIT that effects the same transfers. Proof:

- Take $g(r_i) = -B + \int_0^{r_i} f(r)dr$, and $g_t(r_{it}) = \int_0^{r_{it}} f_t(r_{it})dr$

- Then
$$\hat{r}_i = r_i - g(r_i) - \sum_{t=1}^T g_t(r_{it})$$
$$= r_i + B - \int_0^{r_i} f(r)dr - \sum_{t=1}^T \int_0^{r_{it}} f_t(r_{it})dr = \tilde{r}_i$$

Economic equivalence

- Any function $\theta(\bar{r}_1, \dots, \bar{r}_P, r_1, \dots, r_P)$ of the post transfers income \bar{r}_i and pre transfers income r_i is identical for a UBI and its equivalent NIT
- Proof:
- By Result 1, post transfer incomes are identical. Hence:

$$\theta(\tilde{r}_1, \dots, \tilde{r}_P, r_1, \dots, r_P) = \theta(\hat{r}_1, \dots, \hat{r}_P, r_1, \dots, r_P)$$

Economic equivalence

- Example functions:
- Net cost: $\theta(\bar{r}_1, \dots, \bar{r}_P, r_1, \dots, r_P) = \sum_i \max\{0, r_i - \bar{r}_i\}$
- Marginal tax rate: $\theta(\bar{r}_1, \dots, \bar{r}_P, r_1, \dots, r_P) = \frac{d}{dr_i}(r_i - \bar{r}_i)$
- % in poverty: $\theta(\bar{r}_1, \dots, \bar{r}_P, r_1, \dots, r_P) = 1/P \sum_i 1\{\bar{r}_i > c\}$
- Utilitarian wellbeing: $\theta(\bar{r}_1, \dots, \bar{r}_P, r_1, \dots, r_P) = 1/P \sum_i u(\bar{r}_i)$
- Avg tax, gini coefficient, minimax wellbeing, etc

Perspectives

- Intertemporal transfers
 - All transfers assumed to be simultaneous so far
 - Similar ideas generalize to intertemporal transfers
- Dynamic effects
 - Static analysis
 - However, dynamic incentives are identical for an economically rational agent
- These results enable several simple statements:
 - "For any UBI, there is a NIT to which an economically rational social planner would be indifferent."
- From an economic perspective, any UBI has an equivalent NIT

Psychological cost

- Individual economically rational agents care only about their absolute income. They therefore should be indifferent between UBI and equiv. NIT
- But human beings are not economically rational
- What quantities *can't* be written as a function of the pre and post incomes?

Prospect theory

- People judge outcomes relative to a *reference* outcome
- Losses from this reference are psychologically more costly than gains
- If people select different reference outcomes for UBI and NIT, they can be psychologically very different
- Ex: If people use their post-UBI pre-tax income as reference for the UBI, but their pre-tax income as reference for the NIT, then the UBI tax bill will look like a steep loss compared to the equivalent NIT

Political intuitions/imagination

- Different policies *suggest* different implementations
- Different histories for the policies *suggest* different implementations
- NIT suggests (but does not require) funding predominantly from income tax
- UBI might suggest (but does not require) funding from more diverse sources like sovereign wealth fund
- NIT in the US recalls the Nixon-era proposal of a small means tested NIT

Outline

- Gross vs net costs
- Marginal tax rates vs Average tax rates
- Universal basic income vs Negative income tax
 - Economic cost
 - Psychological cost
 - Political intuitions/imagination
- The real debate: different policies
- Suggestions for communicating cost

The real debate: different policies

- Why do so many studies find differences in cost between UBI and NIT, given that they can be provably identical?
 - Sometimes, they make the gross cost error
 - Sometimes, they compare *different policies*

Policy 1:	UBI of \$100, tax of 10%	Equivalent NIT g_1	Net cost: \$1mil
Policy 2:	UBI of \$100, tax of 30%	Equivalent NIT g_2	Net cost: \$500k

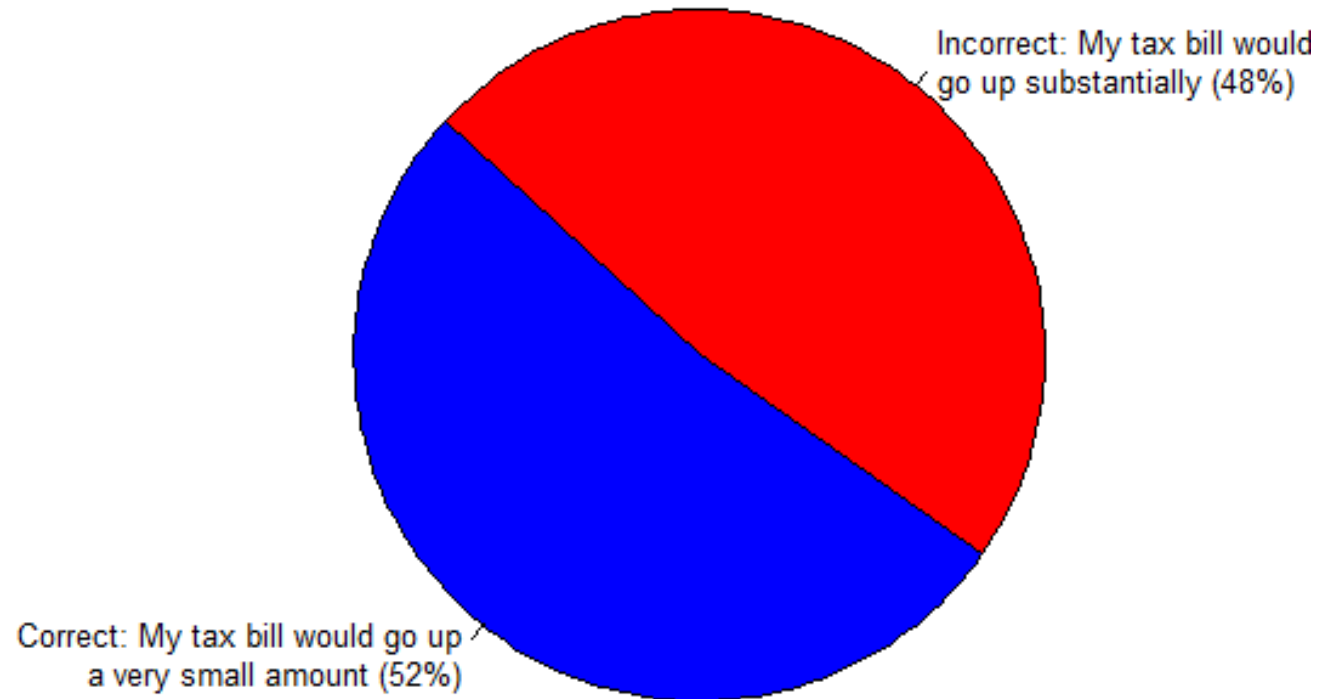
Suggestions for communicating cost

- UBI advocates should focus on net cost, not gross cost
- Marginal tax rates are insensitive to UBI amount
- UBI advocates should focus on average tax
- For any UBI, there is an NIT that effects the same transfers and costs the same amount
- The real debate is over different policies

Marginal tax rate perceptions

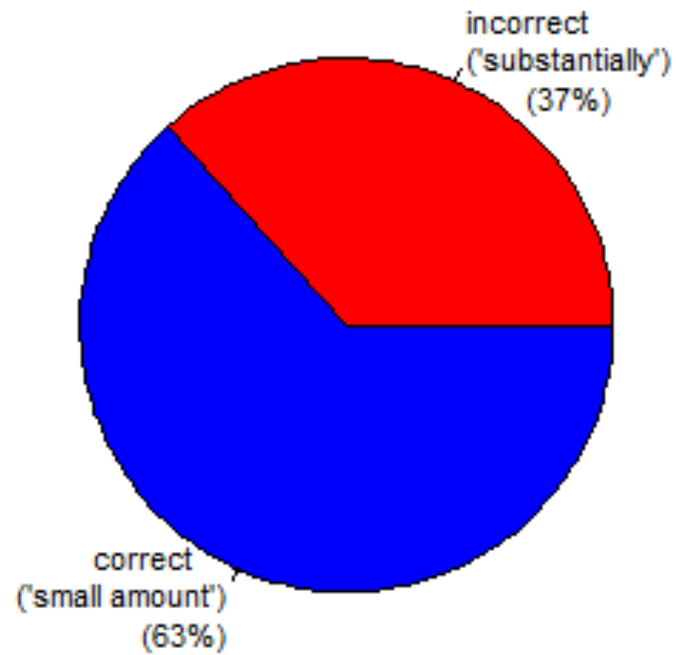
- Marginal tax rates are widely misinterpreted
- High top tax brackets obscure the fact that people can pay far less than this rate in average tax
- This is a political tool

Suppose that your income put you at the very top of the 28% tax bracket and you earned one more dollar such that you were now in the 33% tax bracket

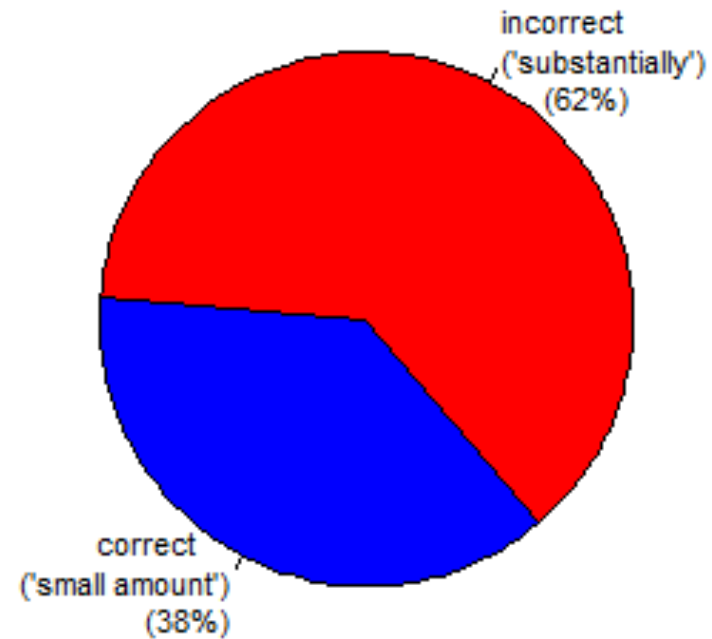


Marginal tax rate perceptions

Democrats
(n = 478)



Republicans
(n = 340)



Marginal tax rate perceptions



Steve Scalise ✓

@SteveScalise

Follow



Republicans: Let Americans keep more of their own hard-earned money
Democrats: Take away 70% of your income and give it to leftist fantasy programs



AOC: How about a tax rate of 70% to fund my Green New Deal?

"Only radicals have changed this country."

hotair.com

Conclusion: Suggestions for communicating cost

- UBI advocates should focus on net cost, not gross cost
- Marginal tax rates are insensitive to UBI amount
- UBI advocates should focus on average tax
- For any UBI, there is an NIT that effects the same transfers and costs the same amount
- The real debate is over different policies