

Taxes, benefits, and labour supply

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Taxing the rich

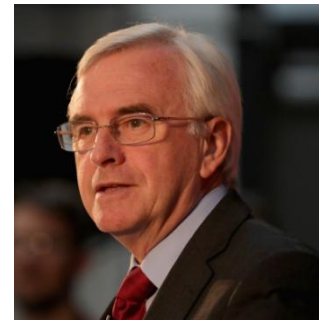
- **Coalition government – cut top rate of tax from 50% to 45%**

- George Osborne, 2016 : “Figures [have been] published... by HMRC ... for 2013-14, which was when the 50p rate was reduced to 45p. The data reveal that in that year there was an £8 billion increase in revenues from additional-rate taxpayers.”



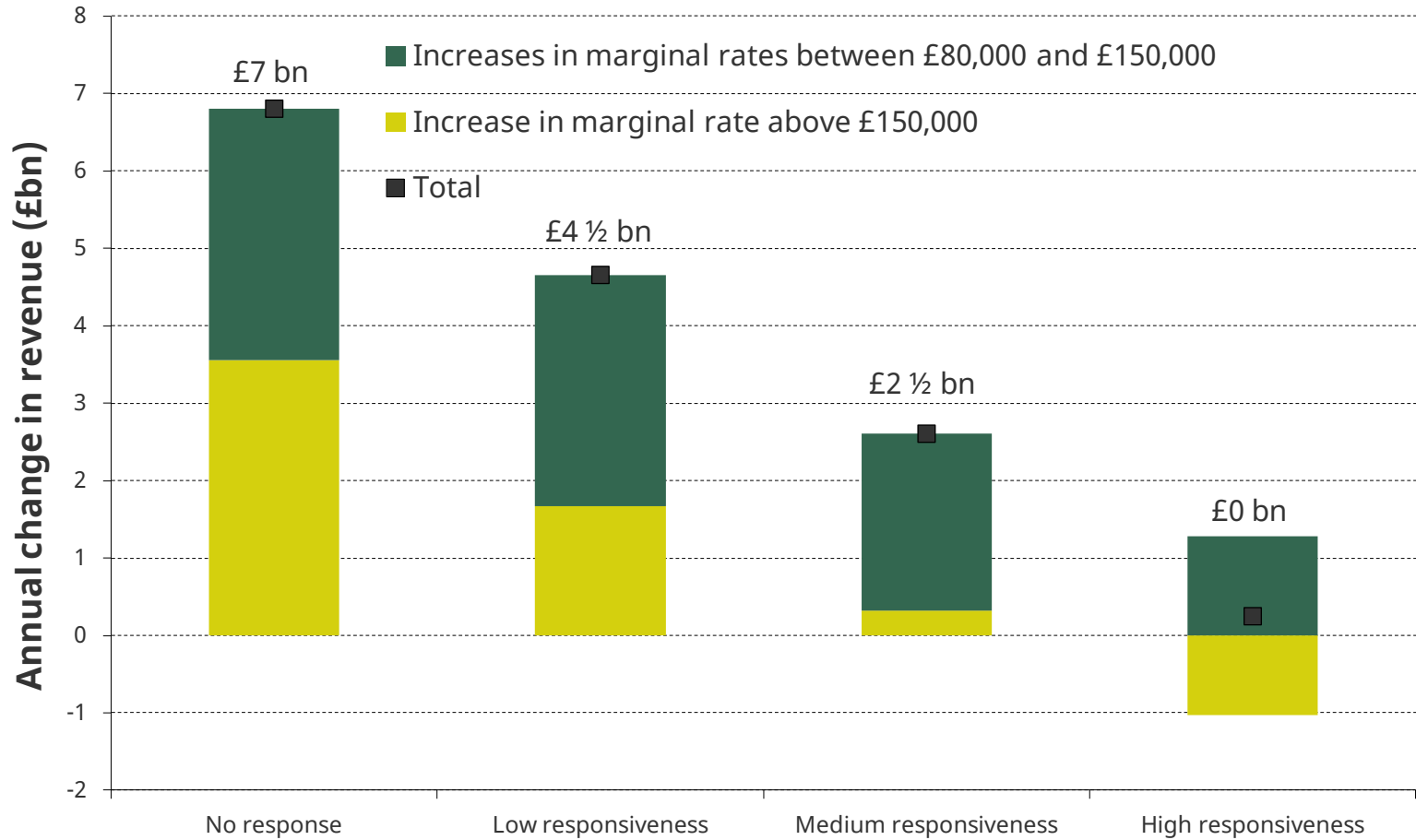
- **2017 election – Labour planned to raise income tax for those earning £80,000+**

- Hoped to raise £4.5bn from the policy



Who is right? How much do these policies raise?

Taxing the rich – responsiveness



Labour supply effects of Universal Credit

Universal Credit (UC) – big overhaul of benefits system

- Integrates six benefits into one
- Smooths budget constraint
- Removes extremely high effective marginal tax rates
- Overall reduces entitlements, but with some winners & losers

Iain Duncan Smith, 2012 – “Universal Credit will mean that work will pay for the first time, helping to lift people out of worklessness and the endless cycle of benefits”



Owen Smith, 2016 – “Everyone can now see that successive cuts to universal credit have destroyed many of the work incentives that were supposed to be the very reason for the scheme”



Questions and (some) answers

Key public policy questions

- What are the consequences of raising top income tax rates?
- How should we design the tax and benefit system to encourage individuals on the margins of the labour market into employment?
- What would be the effect of a Universal Basic Income on work choices?
- What do the redistribution-efficiency trade-offs look like?

What does economics bring?

- Elasticities
 - Helps us think about effects of different sorts of policies
- Econometrics
 - Robustly estimate effects & elasticities – plus give uncertainty

Outline

- 1. A simple model of labour supply**
- 2. Techniques for estimating labour supply elasticities**
 - a. Natural experiments
 - b. Bunching and kinks
 - c. Beyond hours and participation
- 3. Applications**
 - a. Universal Credit
 - b. 50p income tax rate

A simple model of labour supply

Basic notions

What do we mean by labour supply?

- Extensive margin: whether to work or not
- Intensive margin: how much to work. Just hours? What about effort?
- But as individual or joint (family) decision?
- Static or lifecycle?

What are we trying to estimate?

- Focus is on estimating elasticities
 - Many types of elasticities – Blundell and MaCurdy (1998) for a discussion

A static model of labour supply

Consider individual i with characteristics v_i and preferences over consumption c_i and leisure l_i , and with a time endowment of T and non-labour income of μ_i .

With simple proportional tax or means-tested benefit (τ), they solve:

$$\text{Max } U(c_i, l_i, v_i) \text{ s.t. } c_i = \mu_i + (1-\tau)w_i(T - l_i)$$

Yields labour supply function $h_i = h^s[(1-\tau)w_i, \mu_i, v_i]$. What's the effect of raising taxes?

- Taxes unambiguously reduce probability of working versus $\tau = 0$

But effect on hours worked is less clear...

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Elasticities:

- ε^u – uncompensated: how hours of work respond to a change in $(1-\tau)w_i$
- ε^c – compensated: holding utility constant, how hours respond to $(1-\tau)w_i$
- η – income: how hours respond to a change in μ_i

$$\varepsilon^u = \varepsilon^c + \eta$$

$$? + ?$$

A static model of labour supply

Ultimately the sign and magnitude of these elasticities is an empirical question.

Not looking for 'the' elasticity. Likely to vary:

- Over time
- Over space
- Between people with observable differences
- Between people with unobservable differences
- With non-financial incentives

Techniques for estimating labour supply elasticities

Estimating the elasticity directly

Model suggests hours are a function of marginal net-of-tax hourly wages $((1-\tau)w)$ and other income (μ)

So why not...

$$h_i = \alpha + \beta(1-\tau)w_i + \gamma\mu_i + \phi Z_i + \varepsilon_i$$

Selection: only observe wages for individuals in work

- Running regression only on observations with positive hours will give biased estimates: low wage workers must really like work/dislike leisure

Endogeneity: $(1-\tau)w$ and μ in our hours equation are both likely to be correlated with error term resulting in biased OLS estimates

- Progressive taxes $\rightarrow \tau$ becomes a function of hours – reverse causation
- Measurement error \rightarrow attenuation bias

(Quasi) Natural Experiments

Variation from tax reforms provide potential solution to these issues

- Policy might act as exogenous source of variation, changing tax rates for one group of workers ('treatment') but not another ('control')
- Compare labour supply of 'treated' group to that of 'untreated' group

Diff-in-diff approach relies on 2 key assumptions

- Common trends: e.g. both groups subject to same macro shocks
- Composition of groups does not systematically change

(Quasi) Natural Experiments

Lots of work exploiting the 1986 Tax Reform Act in US

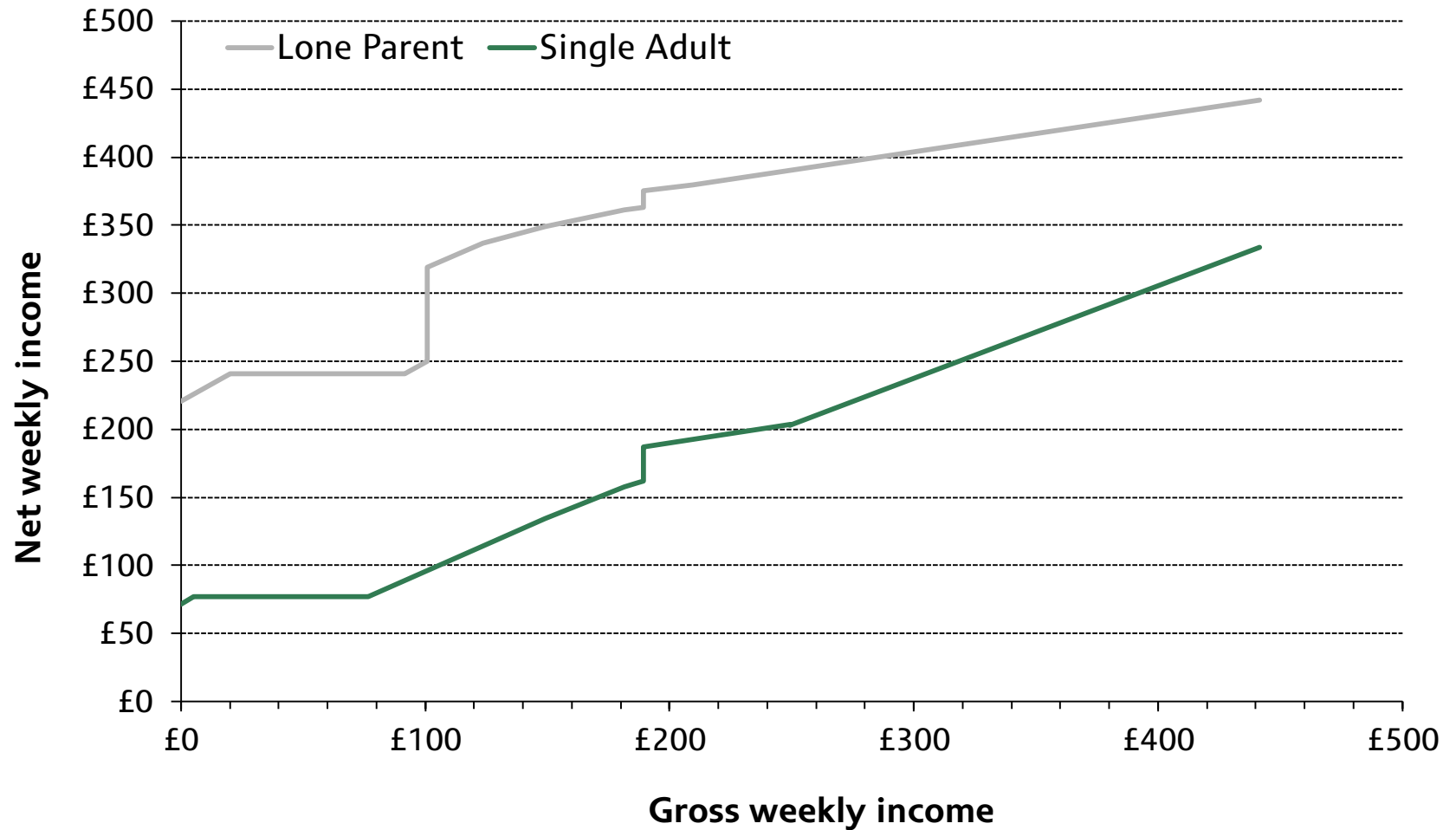
- E.g. Eissa (1995): women with high earning spouse saw large reductions in marginal rates
- Find small increase in hours, large increase in participation for 'treated'
- Problems:
 - Differential shocks – violation of common trends?
 - Group composition affected by reforms?

Bunching at tax (and benefit) kink points

Tax and benefit system make budget set highly non-linear

- Progressive tax structure with numerous kinks
- Withdrawal of means-tested benefits and odd cliff-edges

Non-linear budget sets in the UK



Source: TAXBEN, using April 2013 system. Hourly wage of £6.31 (2013 minimum wage)

Bunching at tax (and benefit) kink points

Tax and benefit system make budget set highly non-linear

- Progressive tax structure with numerous kinks
- Withdrawal of means-tested benefits and odd cliff-edges

Results in two main econometric problems

- Reverse causality: w is a function of hours
- Model misspecification: estimate the wrong parameter

Bunching at tax (and benefit) kink points

Also provides the possibility of identifying behavioural responses

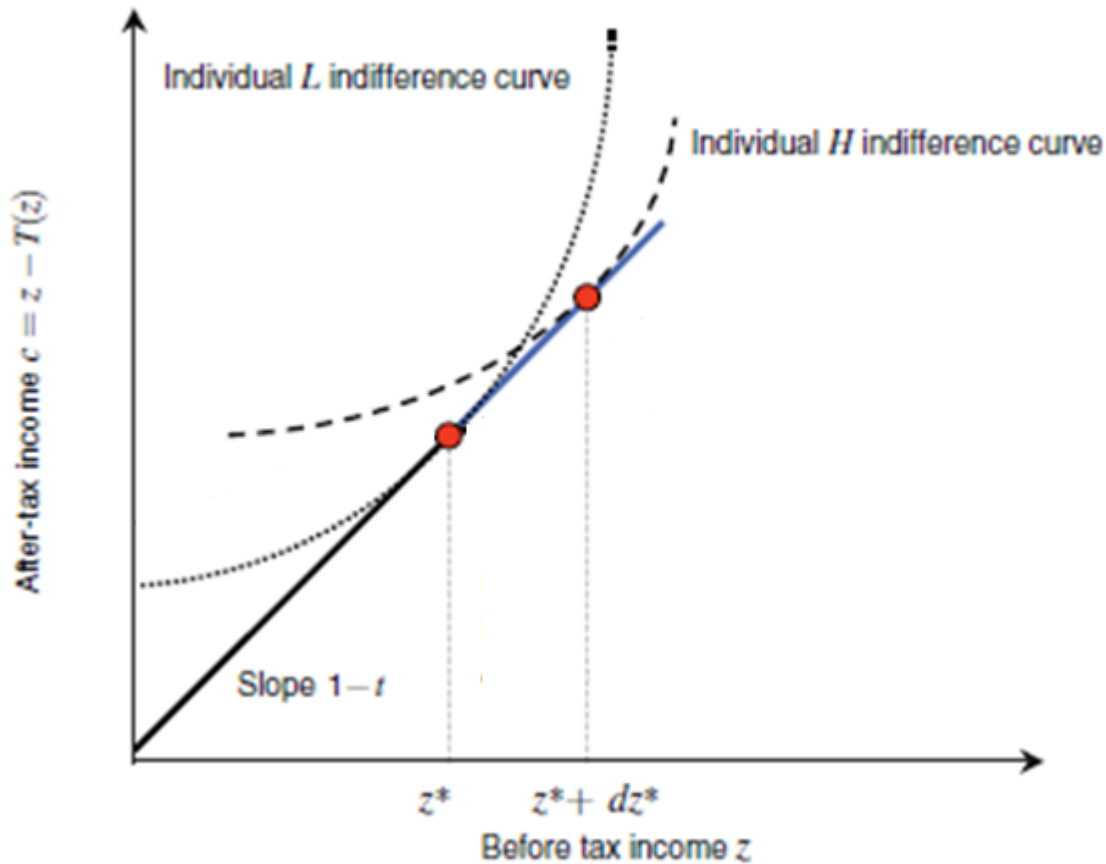
- Model predicts individuals should bunch at kink points of tax schedule

Saez (2010) develops method that relates observed bunching to ϵ^c

- Consider increase in marginal tax rate from t to $t + dt$ at income level z^*

Bunching at tax (and benefit) kink points

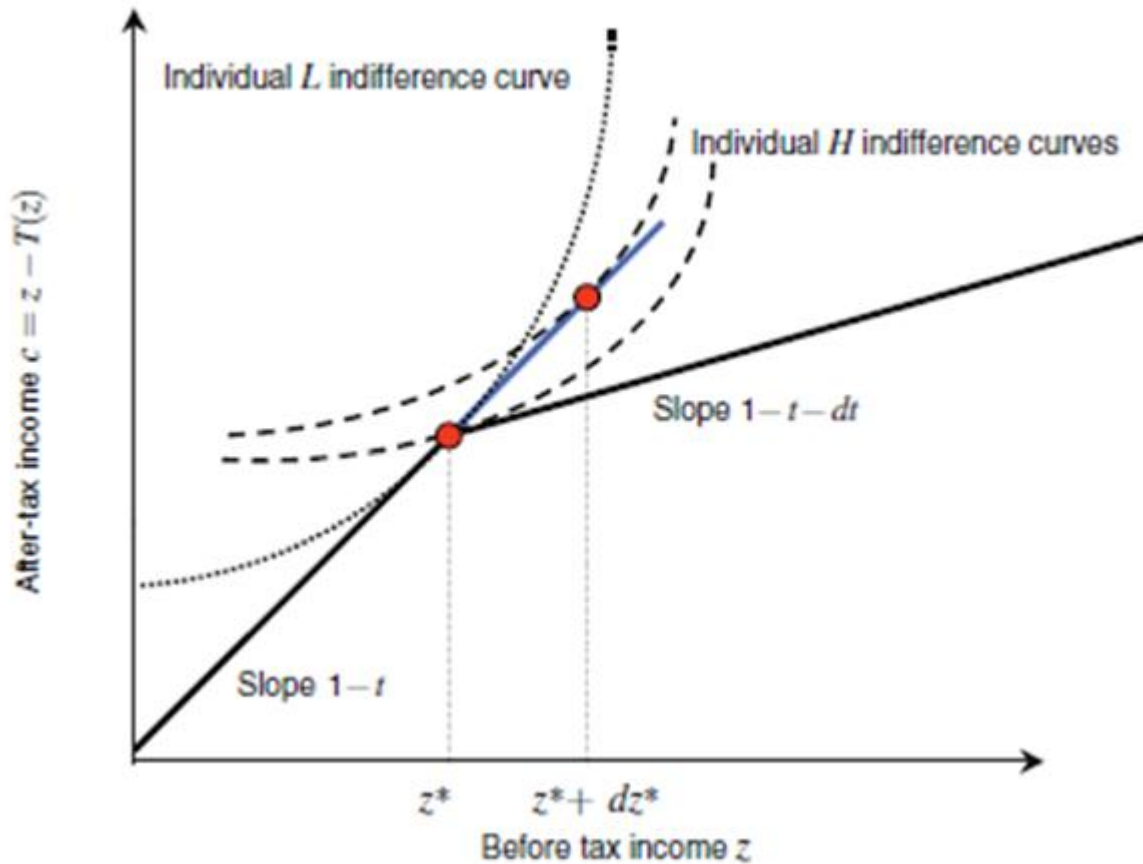
Panel A. Indifference curves and bunching



Source: Saez (2010) Figure 1

Bunching at tax (and benefit) kink points

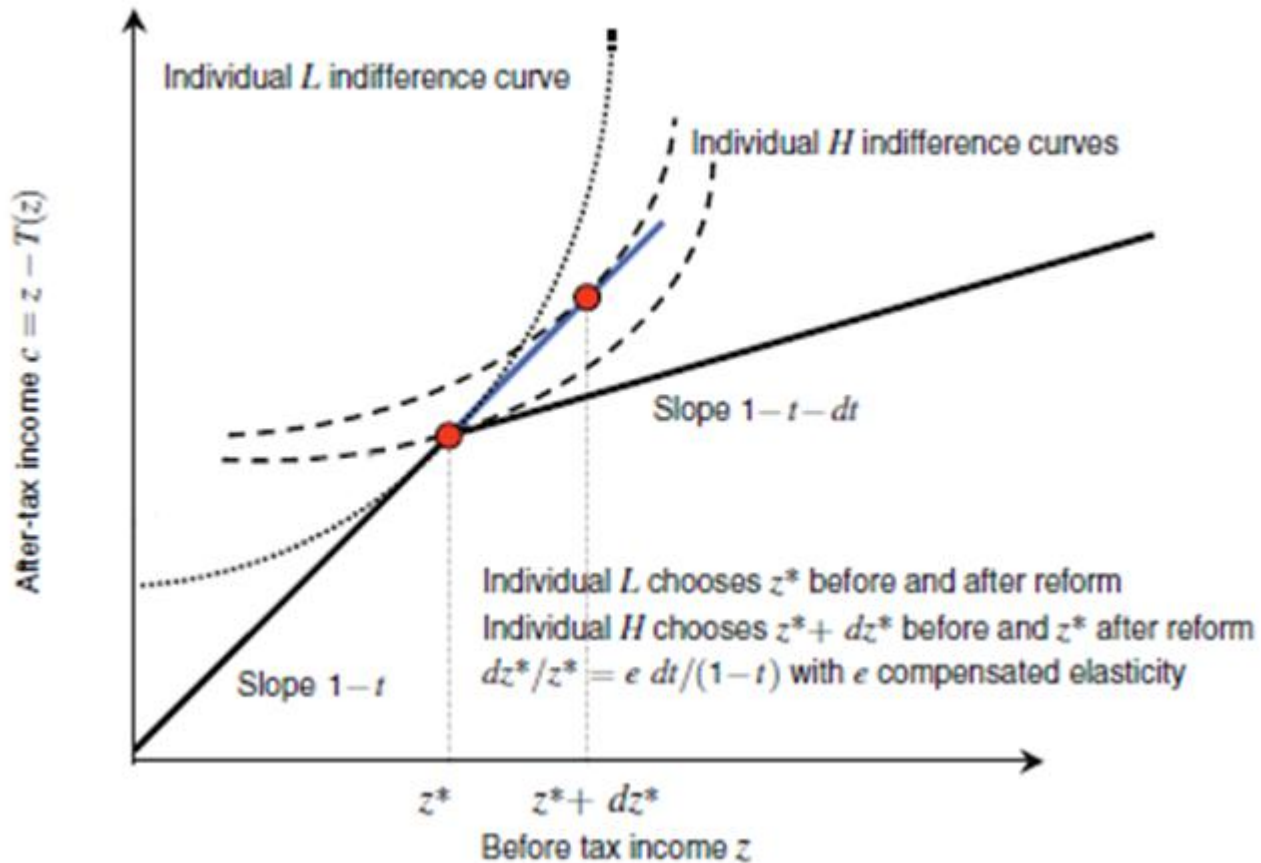
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Bunching at tax (and benefit) kink points

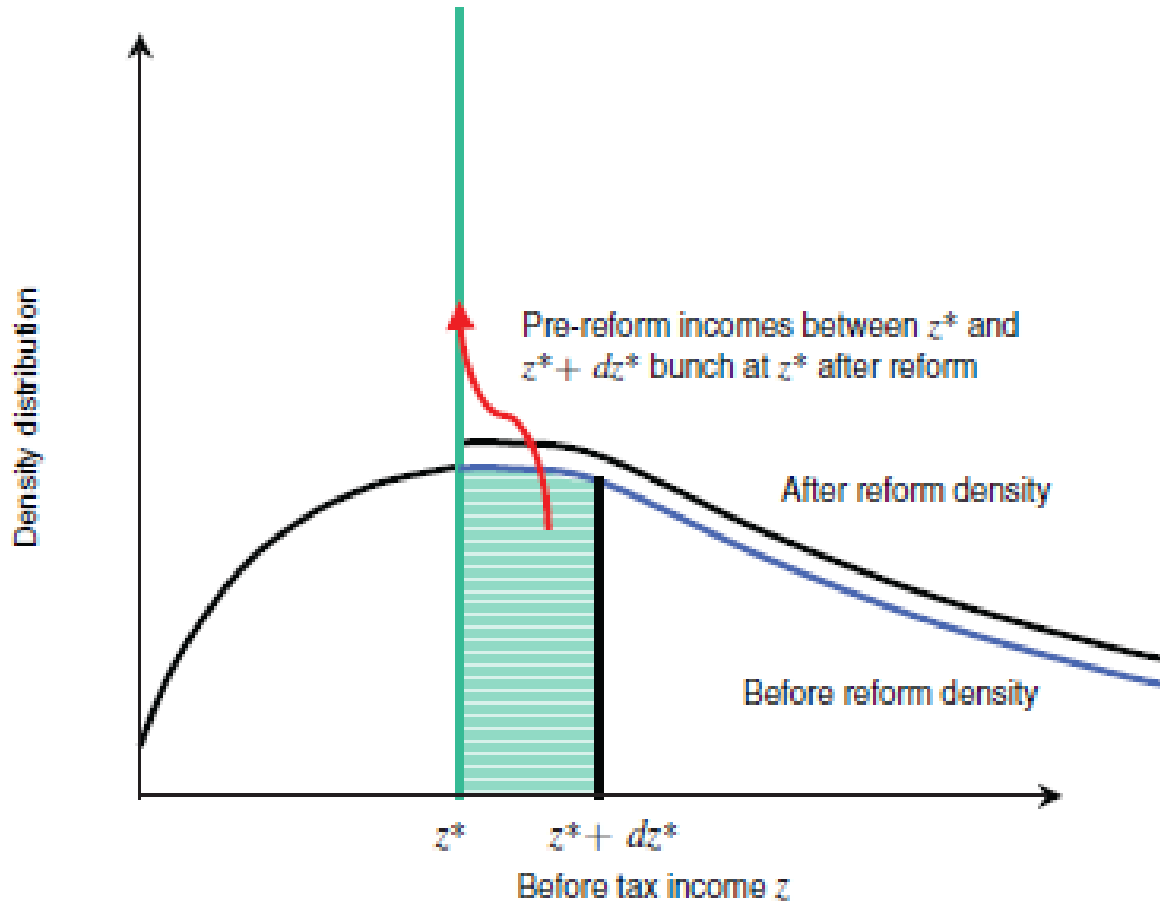
Panel A. Indifference curves and bunching



Source: Saez (2010) Figure 1

Bunching at tax (and benefit) kink points

Panel B. Density distributions and bunching



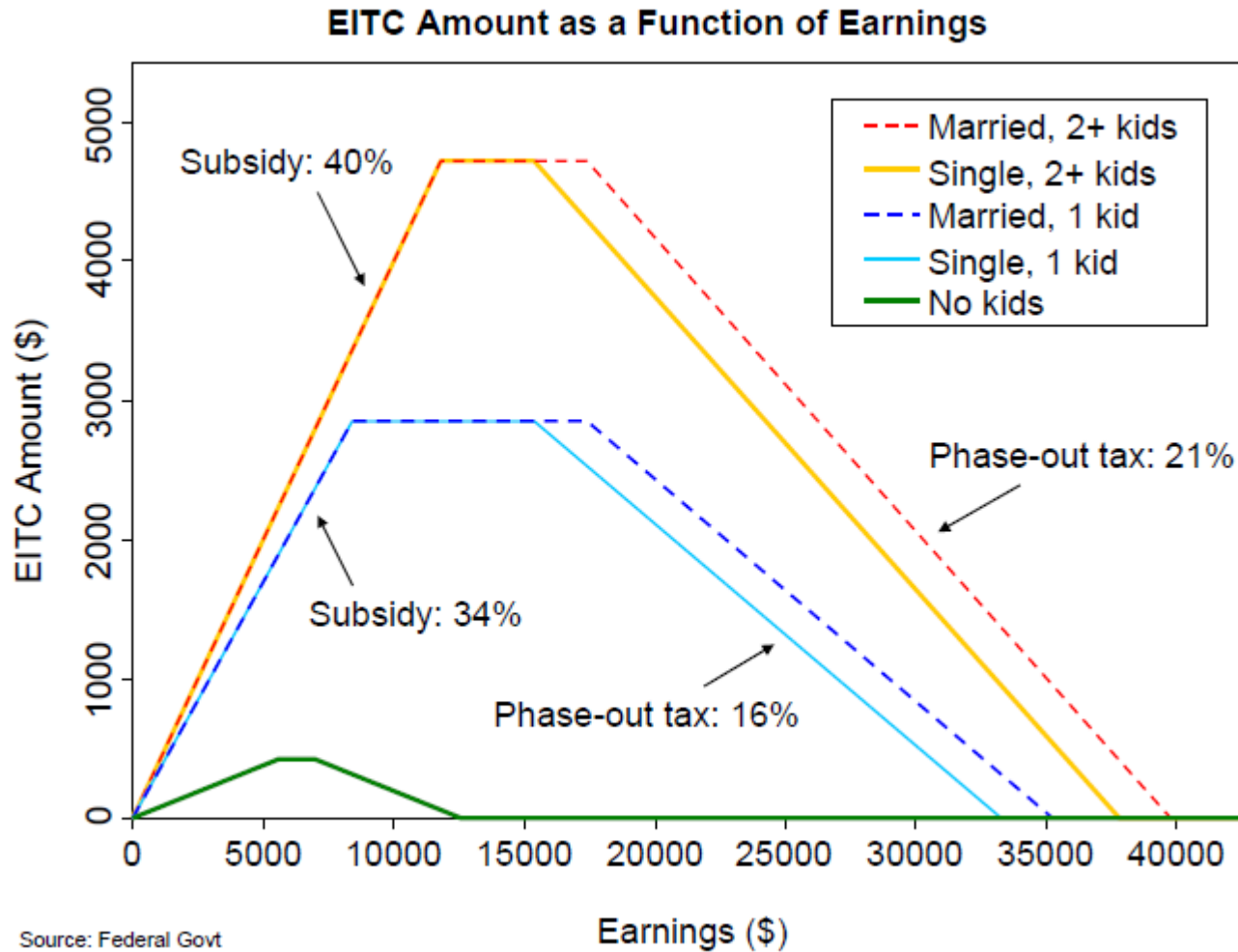
Source: Saez (2010) Figure 1

Bunching at tax (and benefit) kink points

Saez looks at kink points of Earned Income Tax Credit schedule

- Use individual tax return administrative data

Bunching at tax (and benefit) kink points



Source: Federal Govt

Source: Saez (2010)

Bunching at tax (and benefit) kink points

B. Two children or more

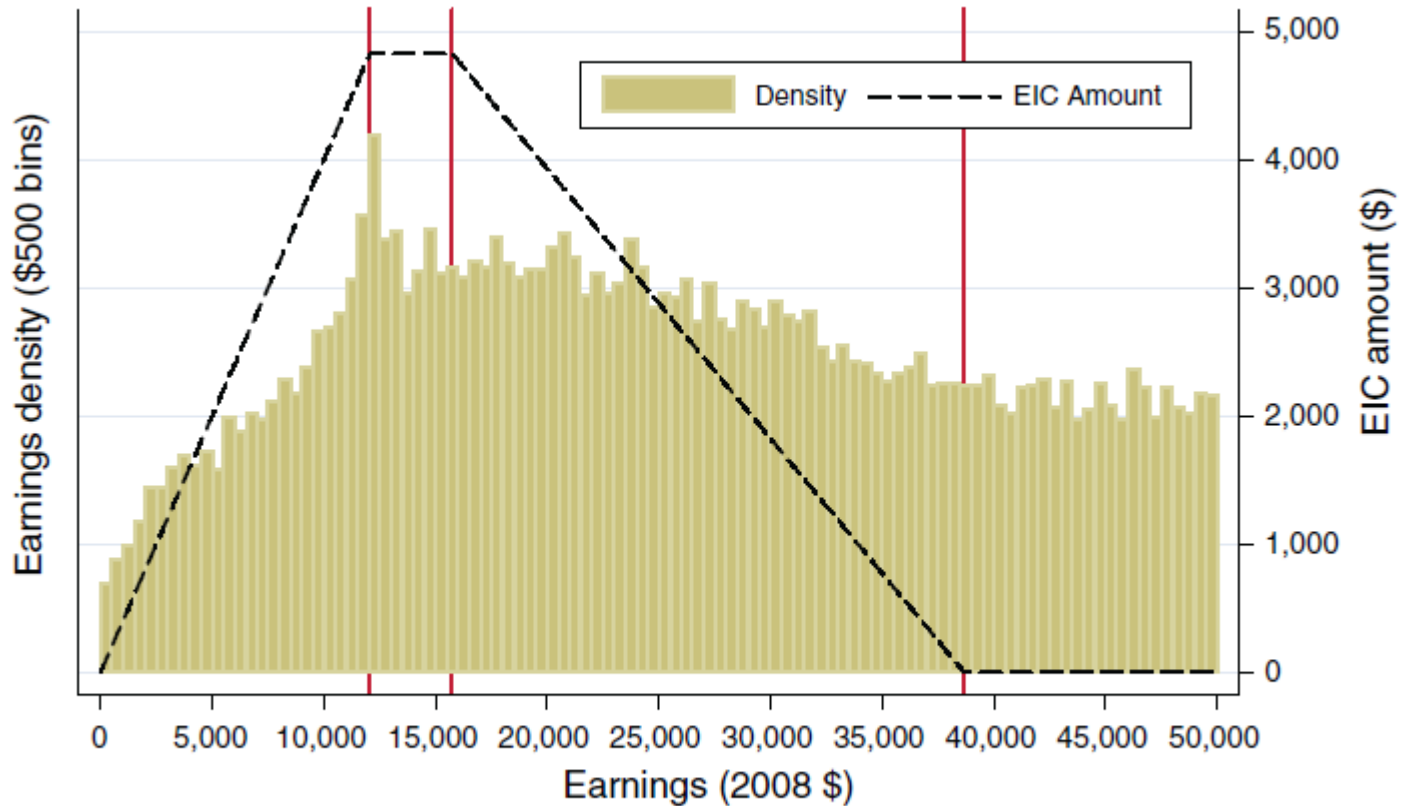


FIGURE 3. EARNINGS DENSITY DISTRIBUTIONS AND THE EITC

Source: Saez (2010)

Bunching at tax (and benefit) kink points

Saez looks at kink points of Earned Income Tax Credit schedule

- Use individual tax return administrative data
- Find bunching at first EITC kink, especially for self-employed
- But no bunching at other EITC kink points, and implied ε very small

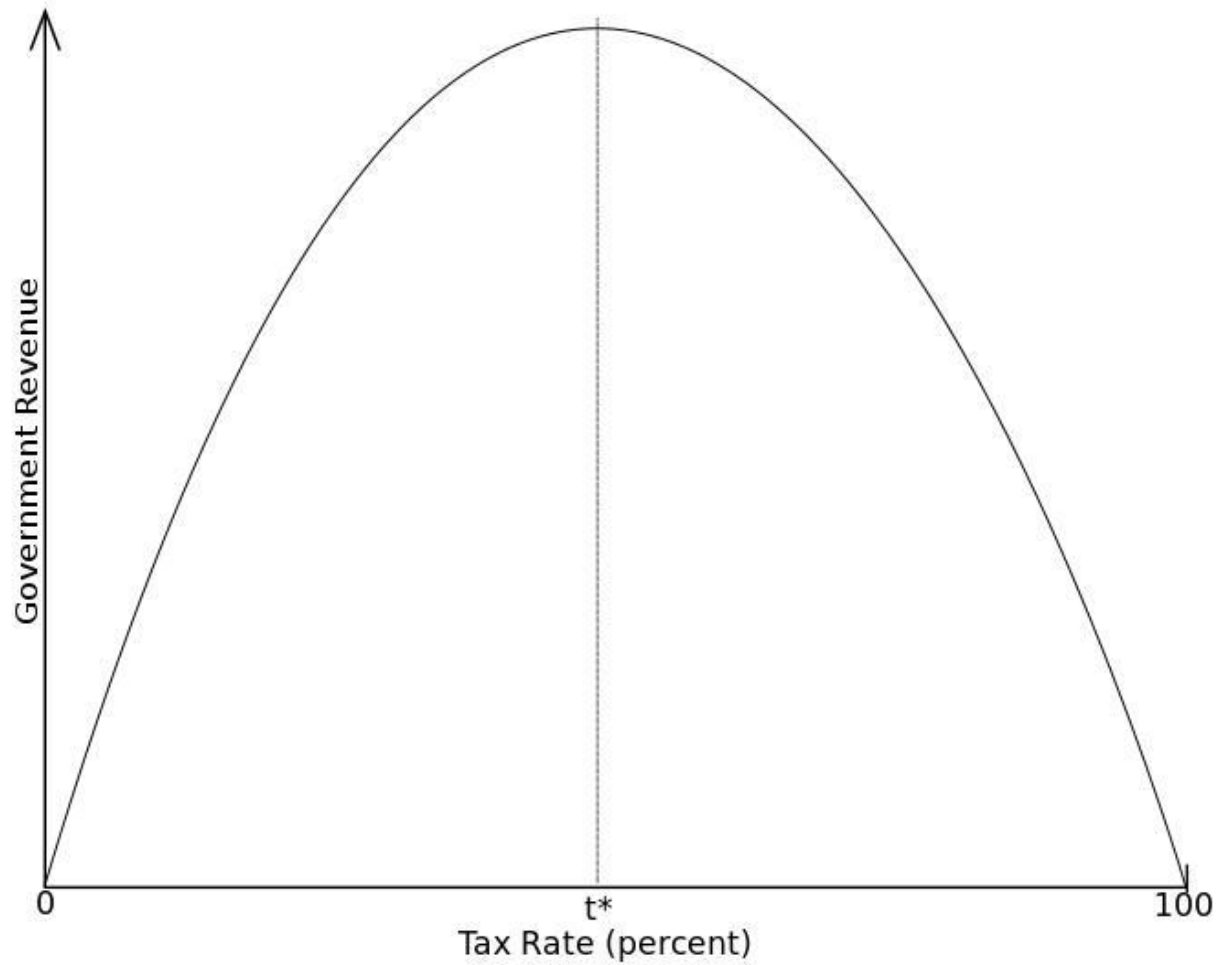
Why don't we see lots of bunching at kink points? Perhaps...

- Behavioural responses to taxation are actually small
- Information and salience (Chetty & Saez, 2013)
- Adjustment costs (Chetty et al, 2011)

Beyond hours and participation

What do changes in tax rates mean for tax revenue?

Laffer Curve



Beyond hours and participation

Labour supply responses affect shape of Laffer curve: but individuals might respond on other margins

- Intensity of effort; bonuses; human capital investment; pension contributions

New tax responsiveness literature: look instead at taxable income

- Taxable income includes traditional labour supply effects, but also income shifting, avoidance, effort

Basics of approach

- Compare taxable income of some group affected by a reform to that of an unaffected group
- Get elasticity of taxable income (ETI) – indicating how responsive taxable income is to change in their marginal tax rate

Applications: Universal Credit, and the 50p income tax rate

Universal Credit

How will UC affect labour supply?

Natural experiment

- Some areas switched from 'legacy benefits' to UC earlier than others.
- DWP (2015) compare similar individuals claiming at similar times.
- Try to control for differences.
- Results for group examined:
 - 8ppt more likely to work at some point 9 months after claim
 - 2% higher total earnings over 9 months (not stat. significant)

More to be done!

The 50p rate of income tax debate

Budget 2009 announced introduction of 50p rate of income tax for those with incomes above £150,000 from April 2010

- At the time, HMT expected it to increase tax revenues by £2.7bn a year post-behavioural response (£6.8bn pre-response)

In Budget 2011, then Chancellor George Osborne asked HMRC to produce a report on how much 50p rate was raising

- Estimated elasticity of taxable income (ETI) → much lower yield of £1 bn

Revenue yield highly sensitive to estimated ETI: if elasticity 0.1 higher than estimated, revenue about £1bn lower.

How did HMRC estimate the ETI?

HMRC estimated what income growth in 2009–10 and 2010–11 would have been for 'treated' (>£150k) group without reform

- Using actual growth for 'control' (£115-£150k) group

And try account for forestalling effect (as policy pre-announced)

- Affected individuals might bring income forward to 40p regime
- HMRC made assumption about how quickly this unwound

HMRC then calculate the elasticity of taxable income

- If net-of-tax rate rises by 1%, how much does taxable income rise by?
- Central estimate of 0.48 → 50p rate raises £1bn more than 40p rate

How did HMRC estimate the ETI?

Are the £115-£150k group a good control group?

- Common trends? 'Control' group affected by other policies introduced at the same time (e.g. withdrawal of personal allowance over £100k)
- No compositional change? Effect of policy may be to induce affected individuals to switch groups (& so increase total income of 'control')

Estimates produced by the model are very imprecise:

- Only two-thirds chance that true ETI between 0.14 and 0.81
- ... and revenue estimates highly sensitive to the ETI (roughly, 0.1 = £1bn)

Summary

Understanding effect of taxes on labour supply crucial for many areas of policy and bigger questions about labour market trends

But identifying behavioural responses and LS parameters difficult

- Endogeneity and selection hamper standard OLS approach in x-section
- Hard to find credible treatment-control groups for experimental design

Yet relative consensus exists on nature labour supply responses

- Prime-aged males very unresponsive in intensive and extensive margin, but taxable income elasticities around 0.2-0.6
- Married women more sensitive to tax rates, particularly on extensive margin
- Presence and age of children in household important

More questions to be answered – importance of dynamics, impact of making systems more transparent, effect of non-financial incentives

Further resources

- Short IFS video (3 ½ mins) covering similar issues (<https://www.ifs.org.uk/publications/7045>)
- LSE video/podcast (1 ½ hrs) “Taxing the rich: A history of fiscal fairness in the United States and Europe” (<http://www.lse.ac.uk/website-archive/newsAndMedia/videoAndAudio/channels/publicLecturesAndEvents/player.aspx?id=3607>)
- EconTalk podcasts (1hr):
 - Mulligan on Redistribution, Unemployment, and the Labor Market (http://www.econtalk.org/archives/2012/12/mulligan_on_red.html)
 - Erik Hurst on Work, Play, and the Dynamics of U.S. Labor Markets (http://www.econtalk.org/archives/2016/11/erik_hurst_on_w.html)
- Literature reviews
 - Meagher & Phillips (2010) – quite accessible
 - Blundell and MaCurdy (1999) – comprehensive

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