

How do taxes and benefits affect labour supply, and how do we know?

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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

What you will learn in this lecture

- How taxes, benefits, and labour supply play into important policy and economic debates.
- The intuition of the method and application of several ways of estimating labour supply elasticities.
- Have a broad sense of key results from the literature.

Taking a step back...

Why have taxes and benefits at all?

- **Fund public services**
- **Redistribute income**
 - Reduce inequality
 - Reduce poverty
- **Provide insurance**
 - Unemployment, low earnings, pension

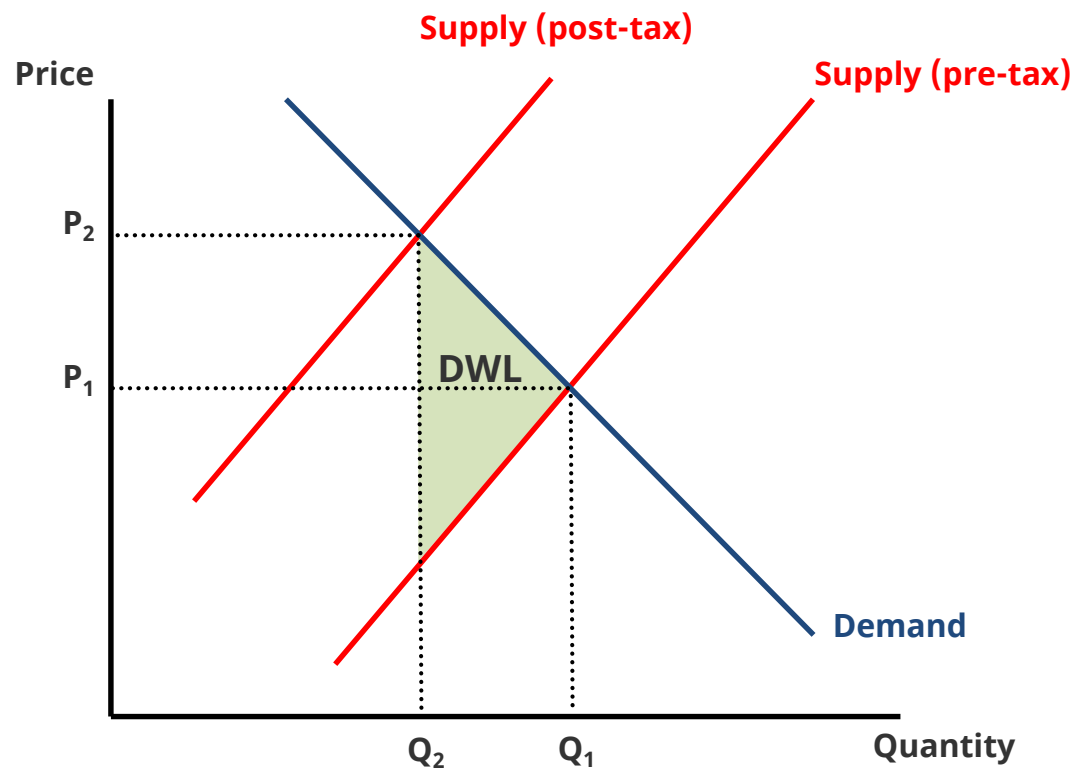
But, comes with an efficiency cost

- **Prevent mutually beneficial exchanges**
 - Distort labour supply incentives

Equity and efficiency

Key concept: the equity/efficiency trade off

- Equity – can take from the rich to give to the poor
- Efficiency – taxes create deadweight loss



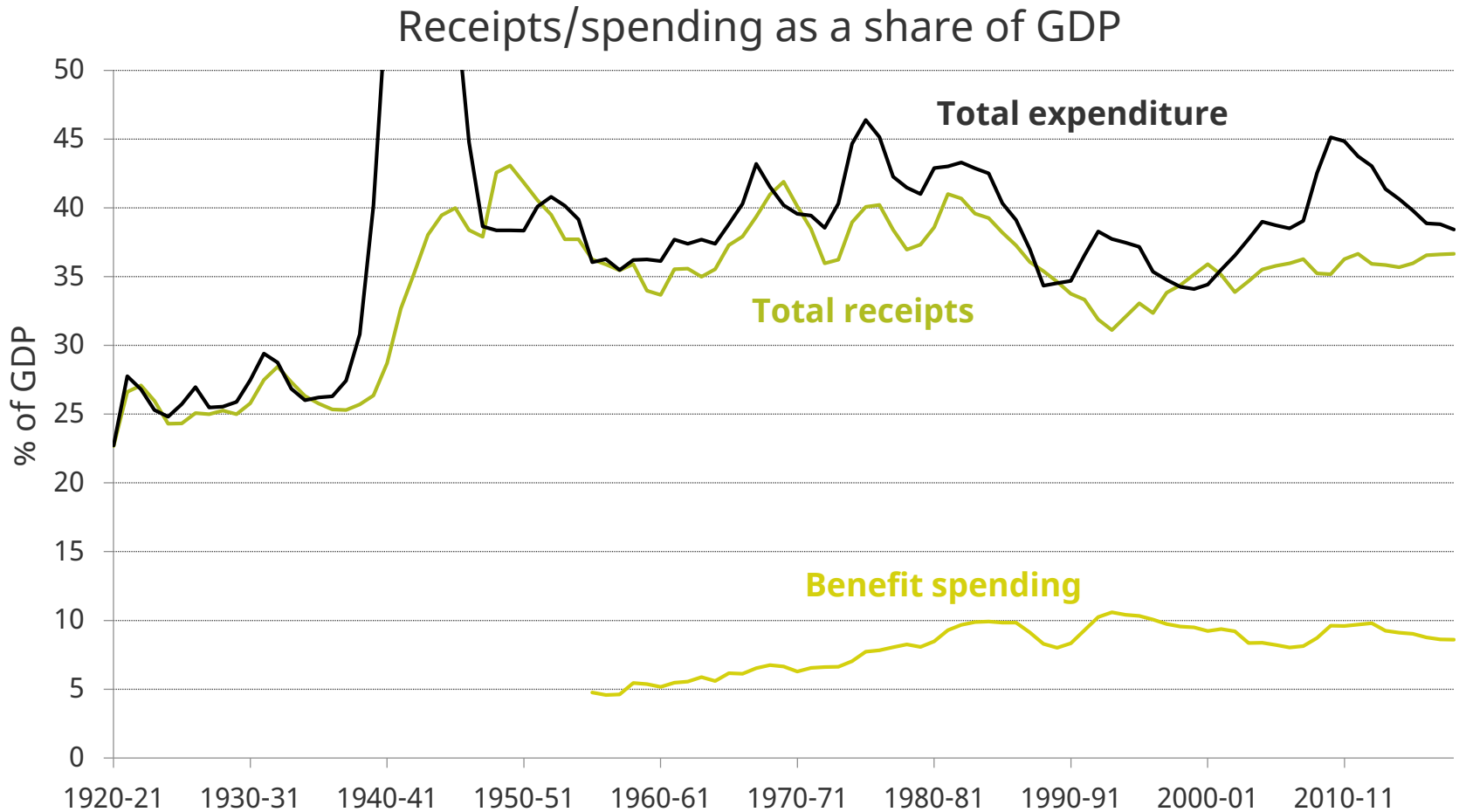
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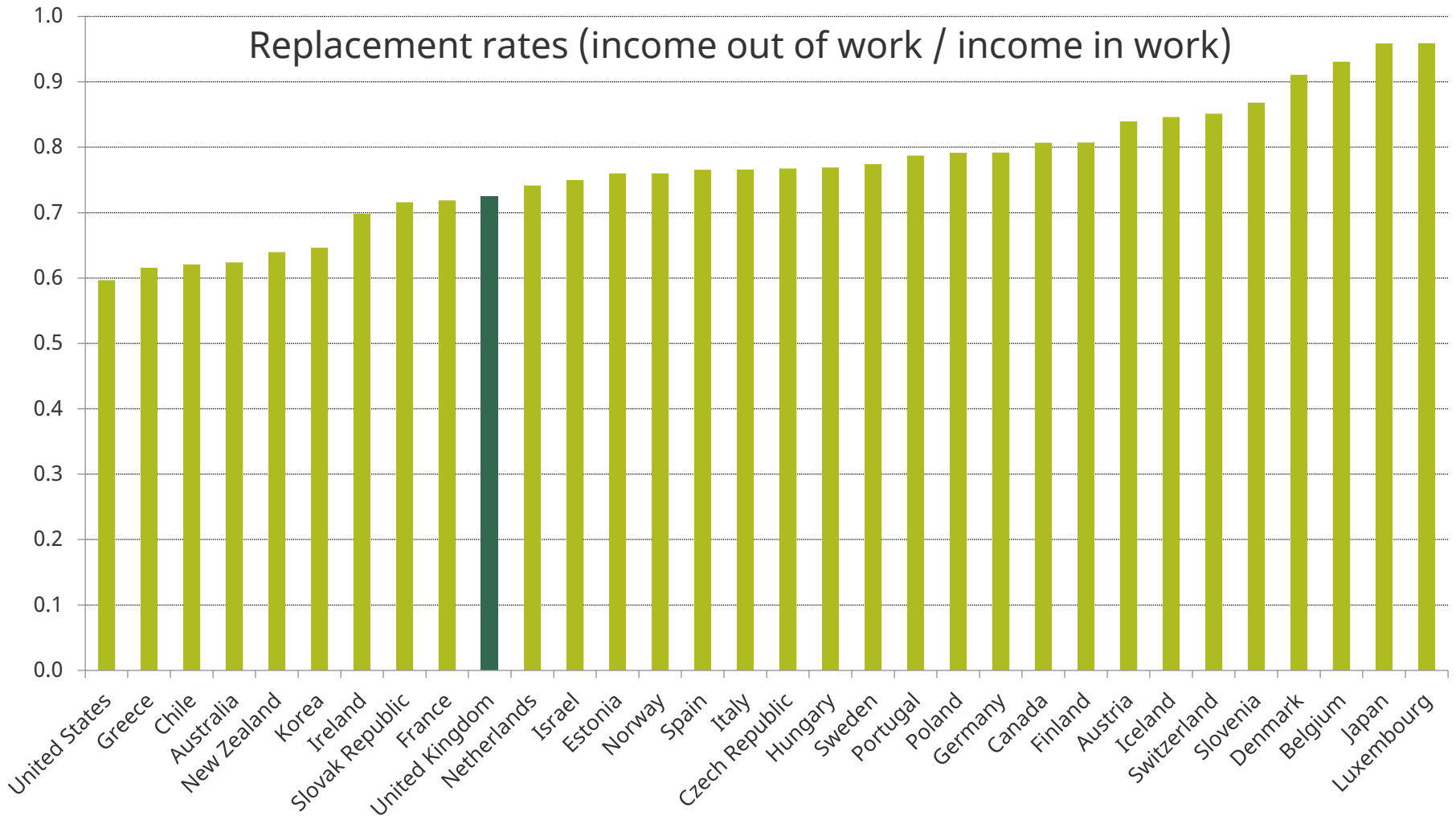
Today looking at trade-off in context of direct taxes and benefits

What choices have UK governments made given these trade-offs?



Source: OBR, March 2018 EFO

What choices have other governments made?



Source: OECD Benefits and Wages Statistics. NB. For a lone parent, 2 children, 67% of average earnings, initial phase of unemployment

Public policy choices and public economics

Different choices → different outcomes (who works, how long, income distribution...)

Economic analysis of taxes and benefits helps us better understand the impact of these choices and evaluate them

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?

Public policy choices and public economics

What does economics bring?

- Theory
 - Help us understand more/less efficient ways of raising tax
 - Model labour supply – conceptualise behavioural responses as elasticities
- Data
 - Distributional analysis
- Econometrics
 - Measure elasticities – magnitude & sign of effects
 - Highlight uncertainty

Mainly going to look at elasticities & econometrics: how can we figure out how people respond?

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. Summary**

A simple model of labour supply

A static model of labour supply

Individual i with preferences over consumption (c_i) and leisure (l_i), and with a time endowment (T), non-labour income (μ_i), and hourly wage (w_i).

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

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

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

- Taxes unambiguously reduce probability of working

But effect on hours worked is less clear...

A static model of labour supply

Consider an increase in $(1-\tau)w_i$

Slutsky equation:

$$\begin{array}{ccccccc} \varepsilon^U & = & \varepsilon^C & + & \eta & & \\ ? & & - & & + & (?) & \end{array}$$

Elasticities:

- ε^C – compensated: holding utility constant, how leisure responds to $(1-\tau)w_i$
 - Substitution effect – leisure becomes more expensive
- η – income: how leisure responds to a change in income (μ_i)
 - Income effect – extra money to spend – maybe more on leisure?
- ε^U – uncompensated: how leisure responds to a change in $(1-\tau)w_i$
 - Total response – do you have more leisure or less?

A static model of labour supply

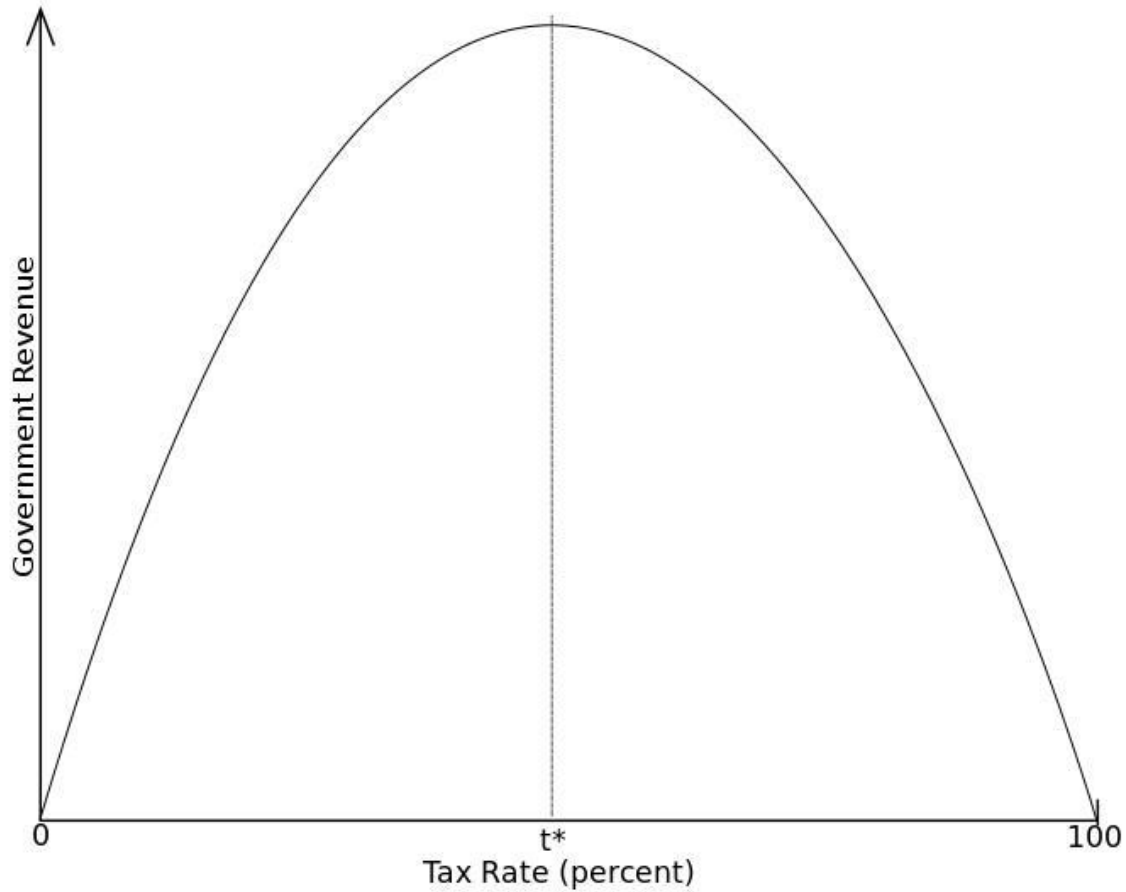
Ultimately the sign and magnitude of these elasticities is an empirical question.

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

Laffer Curve

Labour supply – but also tax avoidance, human capital investment, effort...



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...

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

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 both likely to be correlated with error term – causes bias in estimates

- Progressive taxes $\rightarrow \tau$ becomes a function of hours – reverse causation

Experiments

How would we do this if we were doing medical research?

Get a sample, and randomise people into:

- Treated – get the drug
- Control – get a placebo

And compare their outcomes

Sometimes we can do that in economics – but often not

Quasi Natural Experiments

(Difference-in-difference)

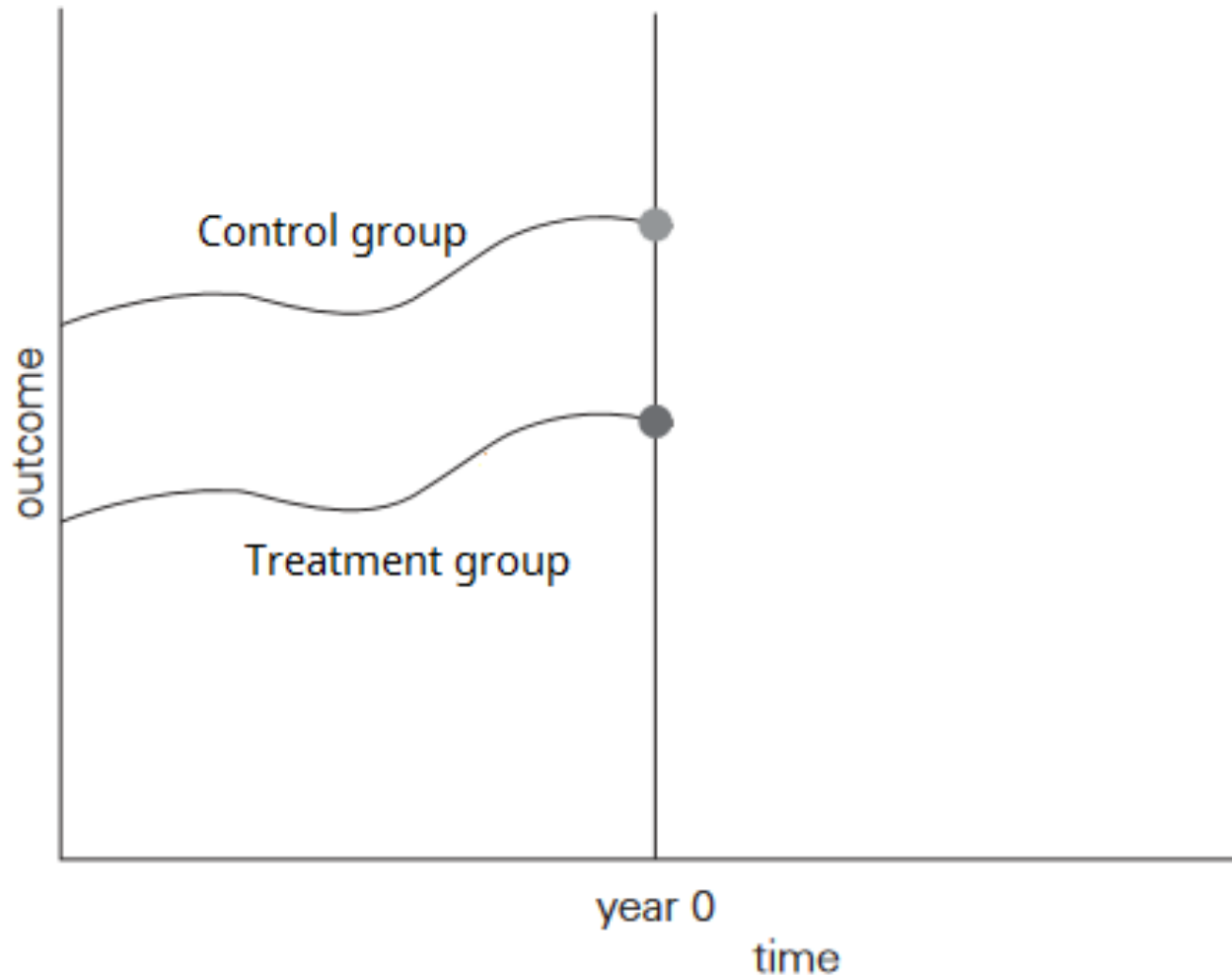
Structure of tax reforms may provide a 'natural' experiment

- Policy changes tax rates for one group of workers ('treatment') but not another ('control')
- Compare labour supply of 'treated' group to that of 'untreated' group

Approach relies on 2 key assumptions

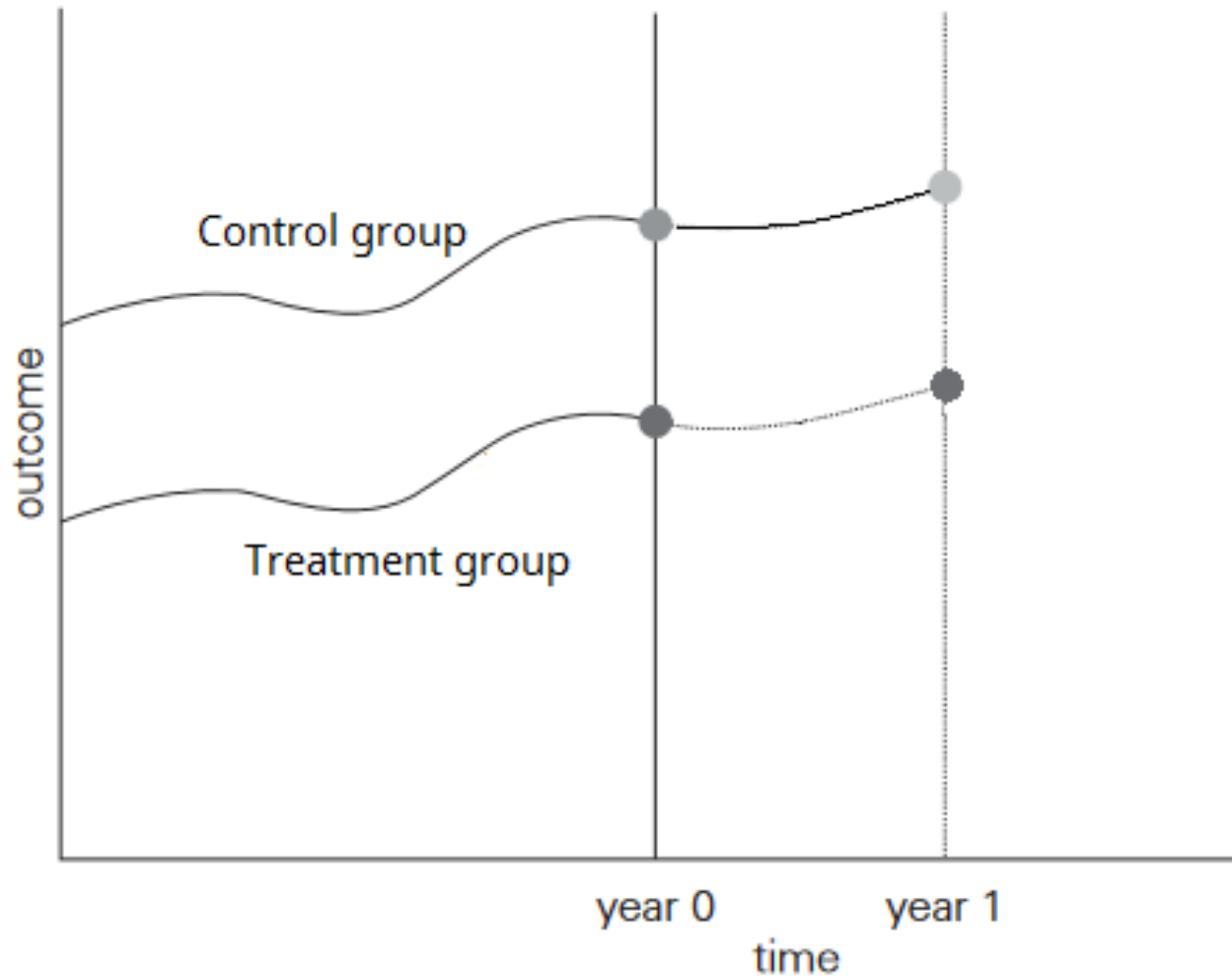
- Common trends: e.g. both groups subject to same macro shocks
 - Drug trial – can't have one group also exposed to additional virus
- Group composition does not systematically change
 - Drug trial – can't have placebo sneaking themselves the real drug

Quasi Natural Experiments (Difference-in-difference)



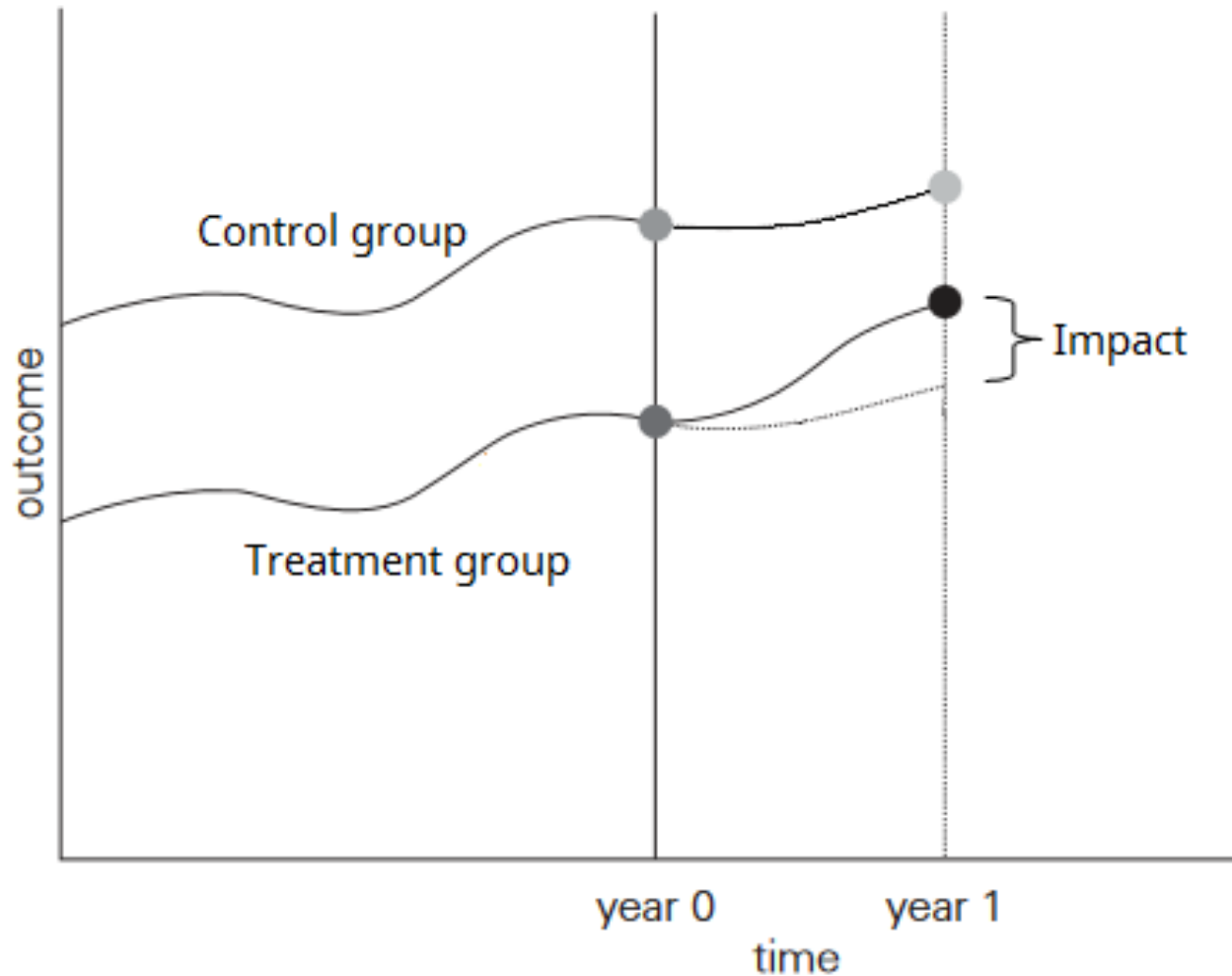
Source: Adapted from World Bank, *Impact Evaluation in Practice*

Quasi Natural Experiments (Difference-in-difference)



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Quasi Natural Experiments (Difference-in-difference)



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Quasi Natural Experiments

(Difference-in-difference)

Eissa (1995) exploits the 1986 Tax Reform Act in US

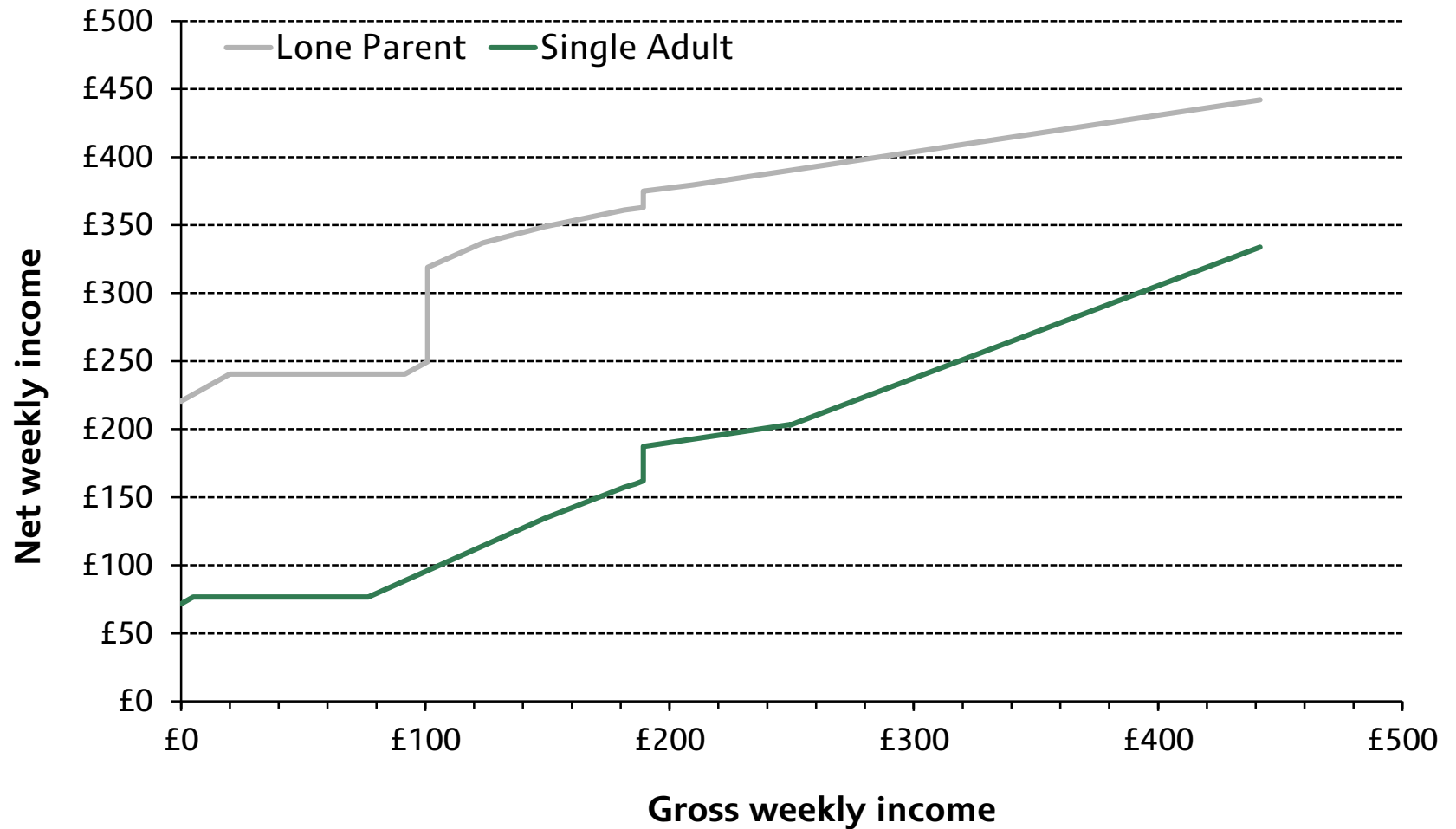
- Women with high earning spouse saw large reductions in marginal rates
 - But little change for women with low earning spouse
- Treatment group – women with spouse at 99th income percentile
- Control group – women with spouse at 90th or 75th income percentile
- Find small increase in hours, large increase in participation (ϵ^u)
- Problems:
 - Common trends? Power couples!
 - Group composition affected by reforms?
- External validity?

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

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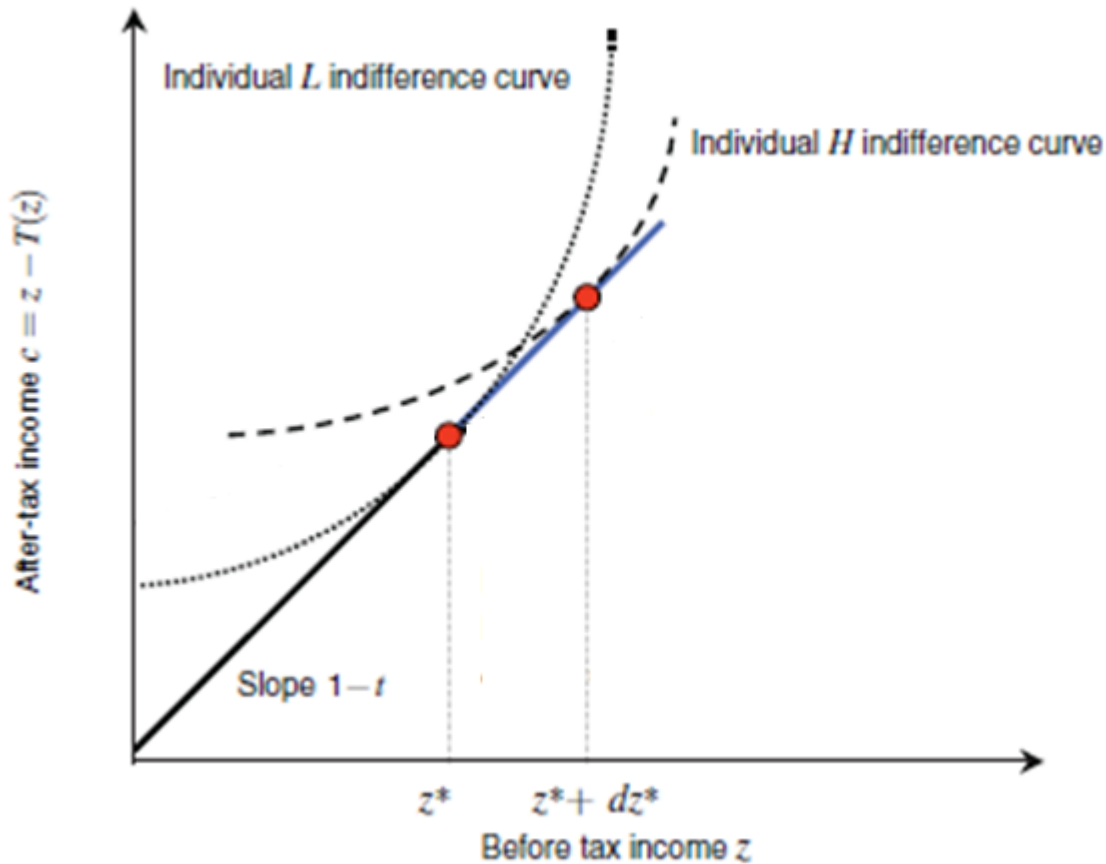
Can allow us to identify behavioural responses

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

Can relate amount of observed bunching to compensated elasticity (Saez 2010)

Bunching at tax (and benefit) kink points

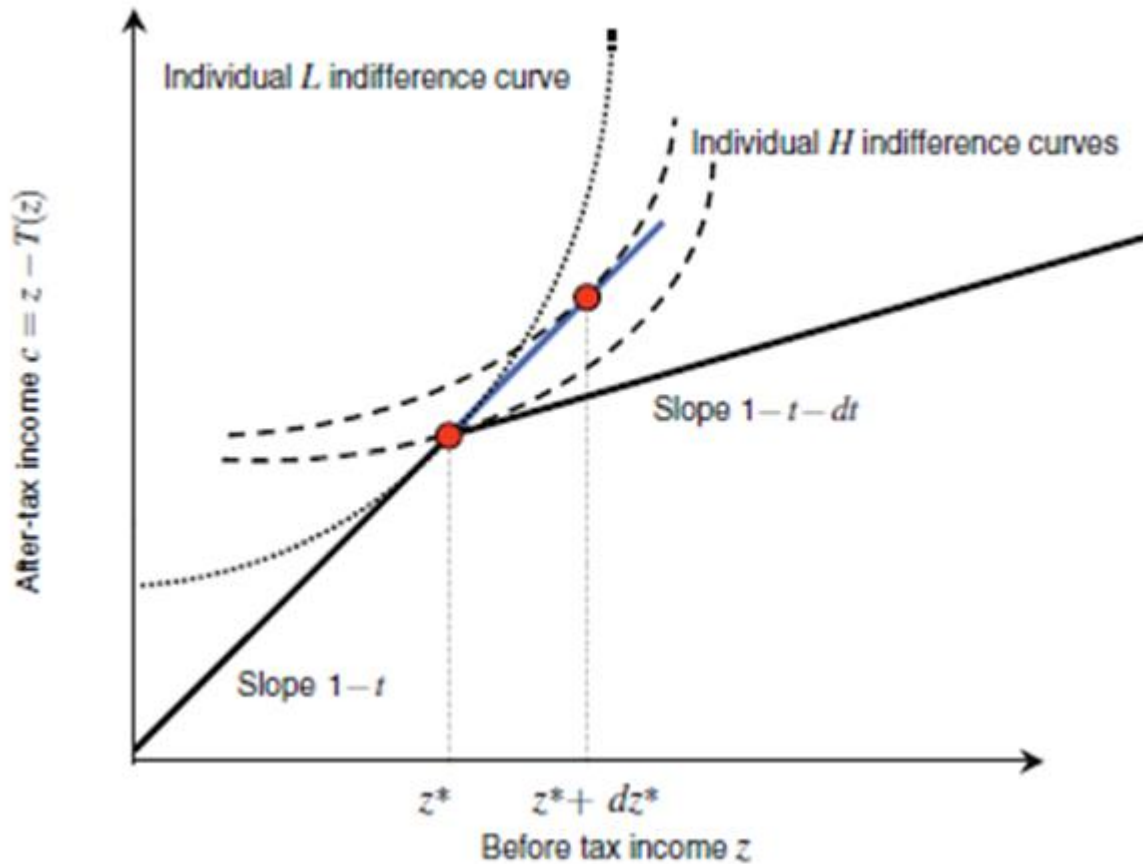
Panel A. Indifference curves and bunching



Source: Saez (2010) Figure 1

Bunching at tax (and benefit) kink points

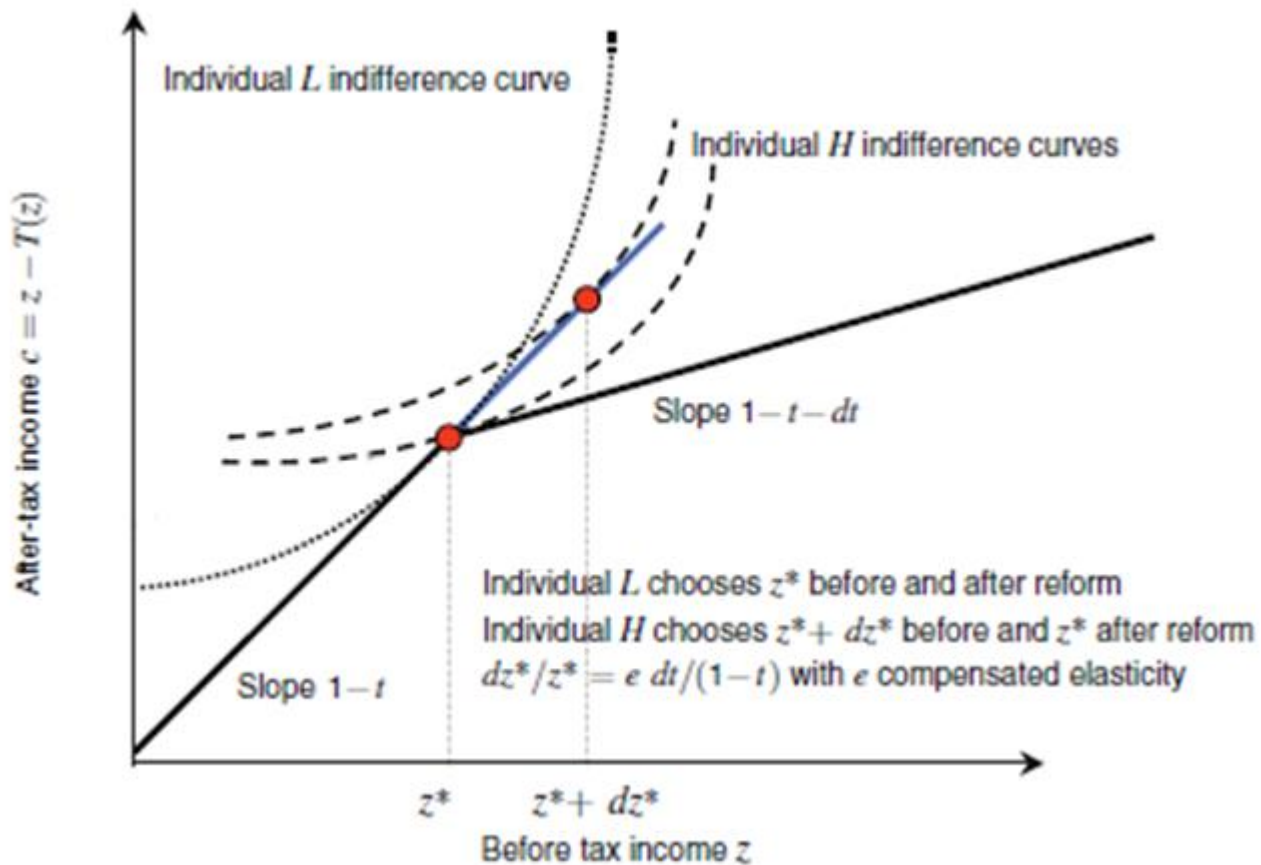
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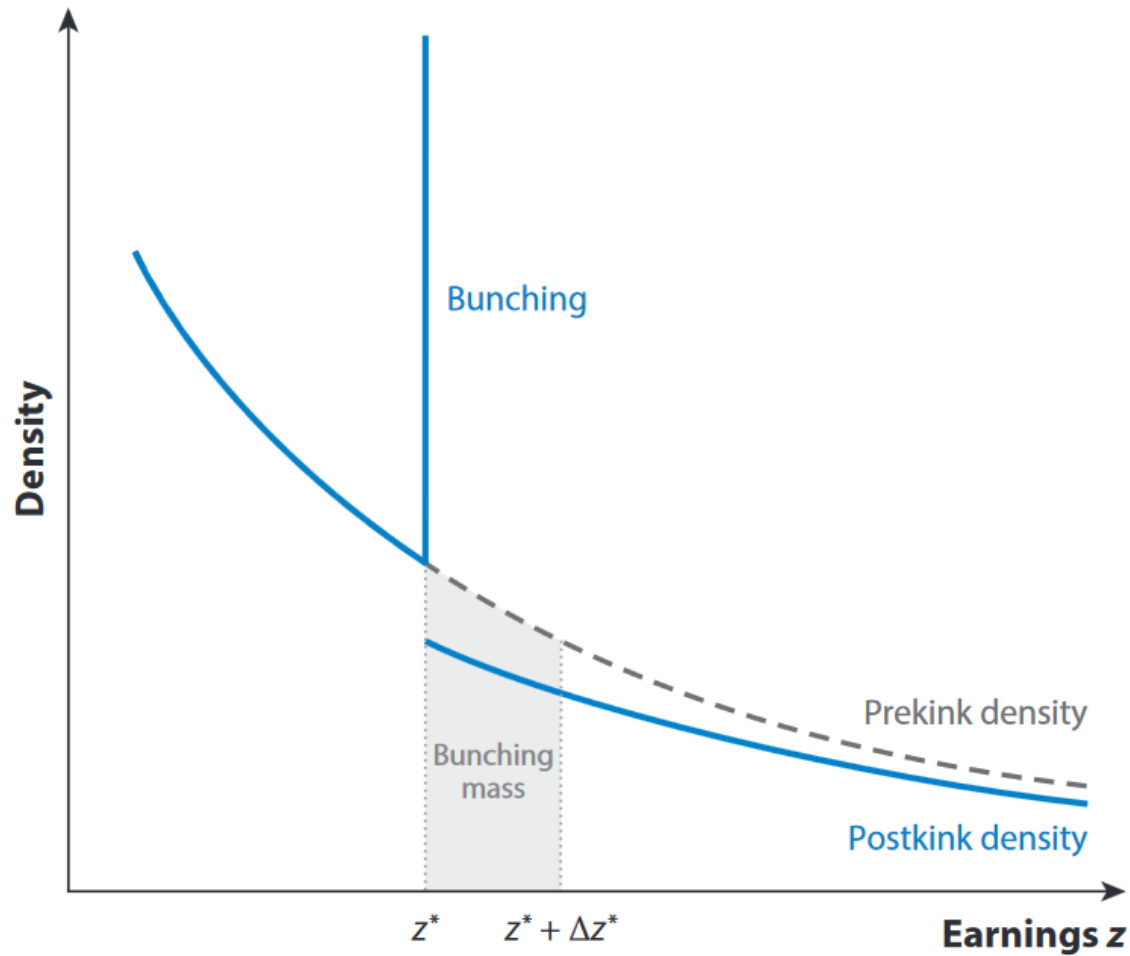
Bunching at tax (and benefit) kink points

Panel A. Indifference curves and bunching



Source: Saez (2010) Figure 1

Bunching at tax (and benefit) kink points



Source: Kleven (2016) Figure 1b

Bunching at tax (and benefit) kink points

Saez looks at kink points of Earned Income Tax Credit schedule

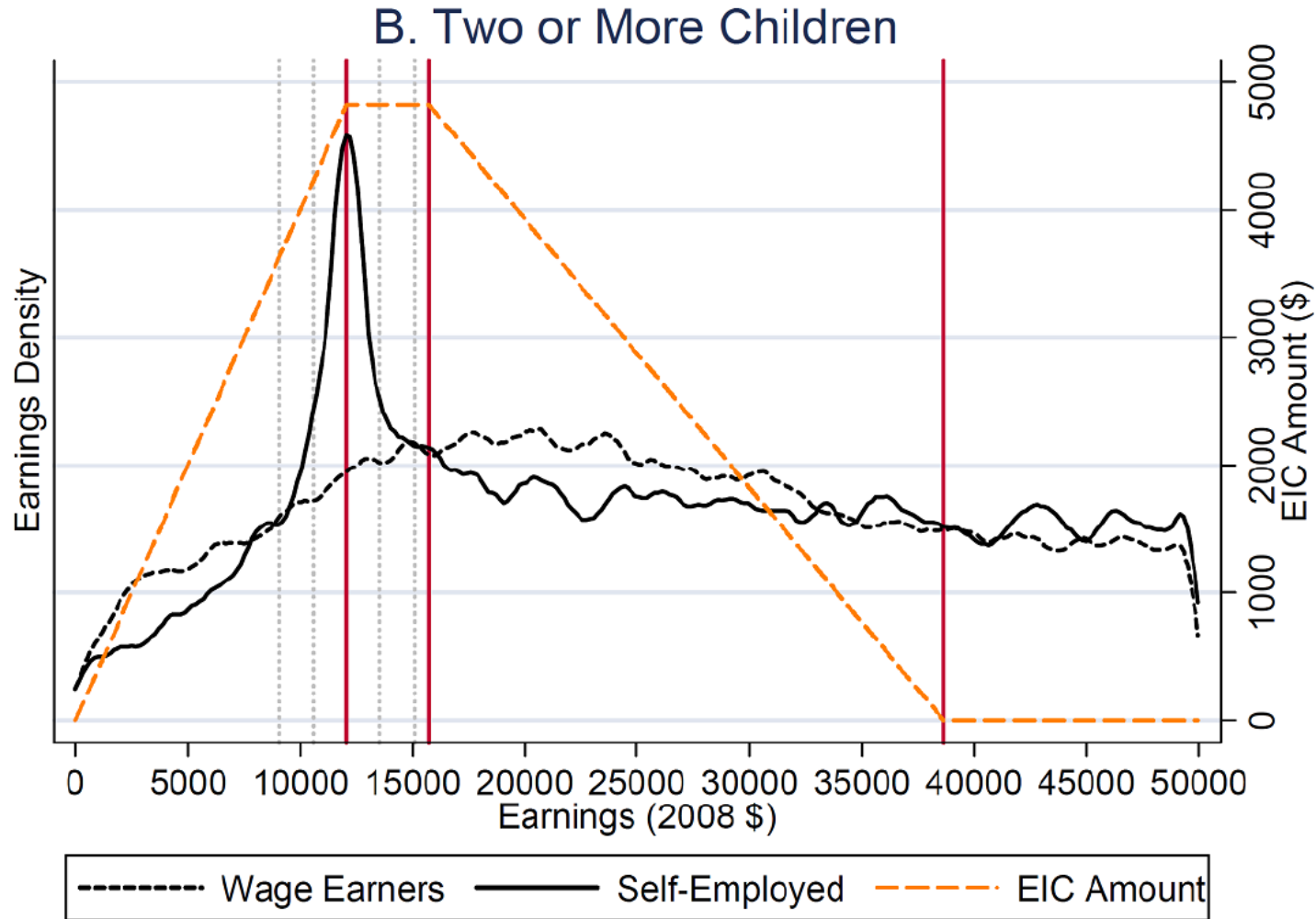
- Use individual tax return administrative data

Bunching at tax (and benefit) kink points



Source: Adapted from Saez (2010)

Bunching at tax (and benefit) kink points



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^c (substitution effect) very small
 - Tells us about deadweight loss

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

- Behavioural responses to taxation are actually small
- Can't perfectly target earnings – so end up at kink + noise
- Information and salience (Chetty & Saez, 2013)

Beyond hours and participation

So far we've been looking at labour supply responses

But people can respond on other margins:

- Intensity of effort; tax avoidance; human capital investment; pension contributions

Affects shape of Laffer Curve

Can instead look instead at 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

How much did the 50p income tax rate raise?

In April 2010, income tax rate on those earning £150k+ increased from 40% to 50%.

HMRC estimated what income growth would have been for 'treated' (>£150k) group without reform

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

Find that 50p rate raises £1bn more than 40p

- But uncertain: 2/3 chance it raised between £4.3bn and MINUS £2.3bn

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

- Common trends? Other policies at same time affect control
- No compositional change? May induce people to switch groups

What we know, what we don't know

- **Intensive & extensive elasticities**
 - Can be significant for women, esp. lone mothers
 - Extensive elasticity for men very low; intensive can be larger, esp. for low educated or older groups
- **Elasticities of taxable income are larger**
 - Even more so for very high incomes
- **More work with admin data finding bigger responses**
 - E.g. Chetty, Friedman, Saez (2013) – big response to EITC in regions where the EITC structure is well known
- ***How* the rich respond less well understood – shifting to capital?**
- **As is dynamics – e.g. response of human capital investment**

Ongoing questions

- **Universal Credit**

- What are UC's labour supply effects?
- How can it be structured to improve work incentives for most responsive groups?

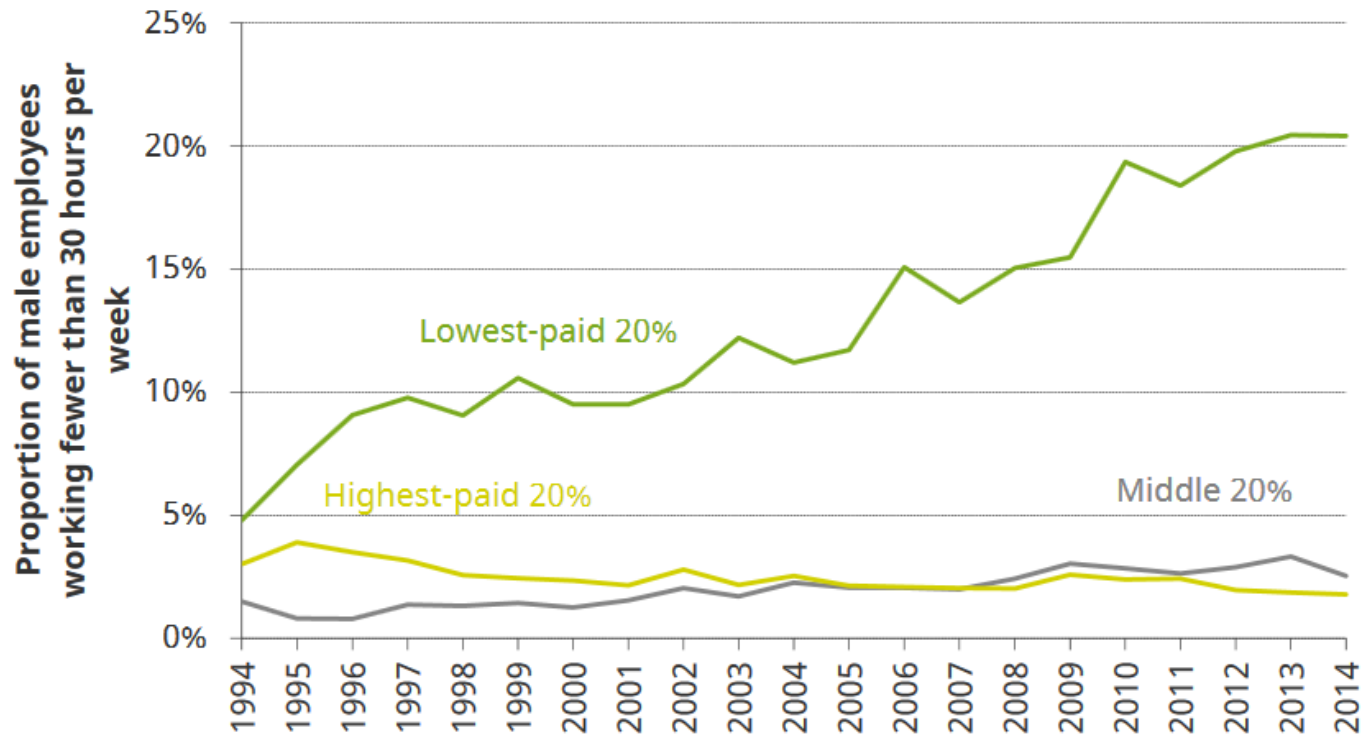
- **Gender pay gap and work incentives**

- How does childbirth affect gender pay gap? (Costa Dias et al. 2018)

- **Part-time work among low paid men**

Dramatic increase in part-time work among low paid men

Annex Figure A. Proportion of men aged 25-55 working part-time by hourly pay, 1994-95 to 2014-15



Note: Sample is male employees aged 25 to 55, excluding those with hourly pay in the bottom 5% or top 5% of the overall hourly pay distribution. Hours are those in main job, and include paid but not unpaid overtime.

Source: Belfield et al. (2017)

Summary

We have theory, econometrics, and data.

- Theory: simple model illuminates importance of elasticities
- Data and econometrics: robustly estimate those elasticities

This lets us better understand responses to taxes and benefits, which matters for public policy.

Further resources

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