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Adjustment costs and labour supply: evidence from bunching at tax thresholds in the UK

Barra Roantree, Stuart Adam, James Browne, David Phillips

Public Economics UK (PEUK), Exeter

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Introduction

- Elasticity of taxable income crucial and controversial parameter

- Recent work has highlighted importance of optimising frictions
  - Chetty (2012): adjustment costs, inattention, and status quo biases can all drive wedge between estimated and true 'structural' parameter
  - Structural preference parameter what matters for long-term welfare and evaluating effects of a tax change in a different setting to that estimated

- This paper estimates ETI & provides evidence on frictions in the UK
  - Part of growing literature using bunching methods developed by Saez (2010), Chetty et al. (2011), and Kleven and Waseem (2013)
  - Exploits cross-sectional variation created by tax thresholds in the UK between 1978-2011

Thresholds in the UK tax system: 1978-2011

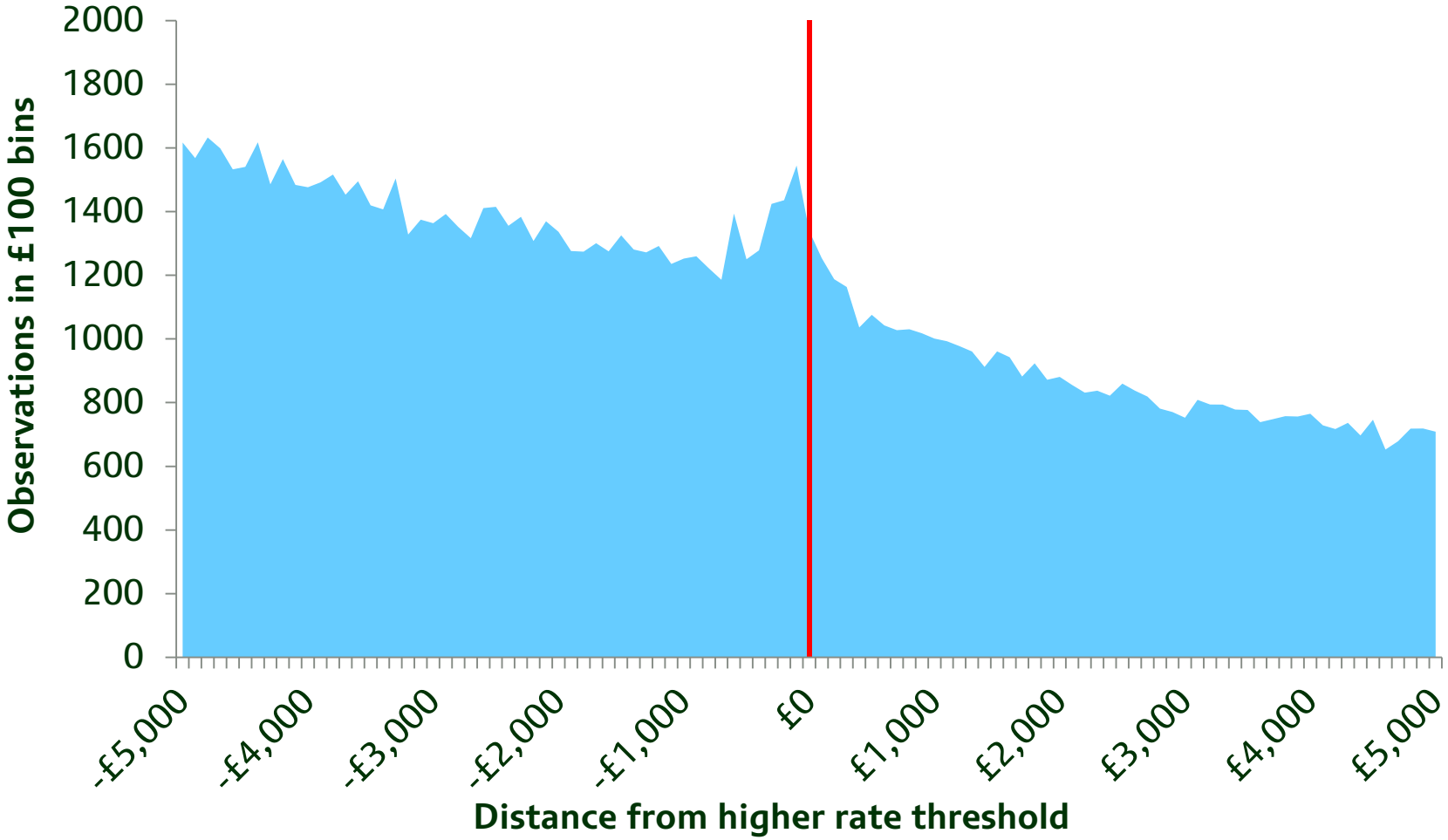
- Look at several kink points in income tax schedule
  - Higher-rate threshold (HRT): rate increases from 20% to 40% at ~£35k pa
  - Additional-rate threshold: rate increases from 40% to 50% at £150k pa
  - Withdrawal of tax-free personal allowance: 60% band at £100k pa

- Earnings also subject to National Insurance contributions (NICs)
  - Nominally paid by both employees and employers
  - Little link to benefit entitlement
  - 1978-85: notch at Lower Earnings Limit (LEL)
  - 1986-1999: small notch at LEL and three notches above
  - System simplified in 1999, with single kink at the LEL replacing all notches

Bunching at kink points in the tax system

- With smooth distribution of convex preferences, individuals should bunch sharply at (convex) kink points in the tax system

See some bunching at UK higher-rate threshold



Add note with years etc

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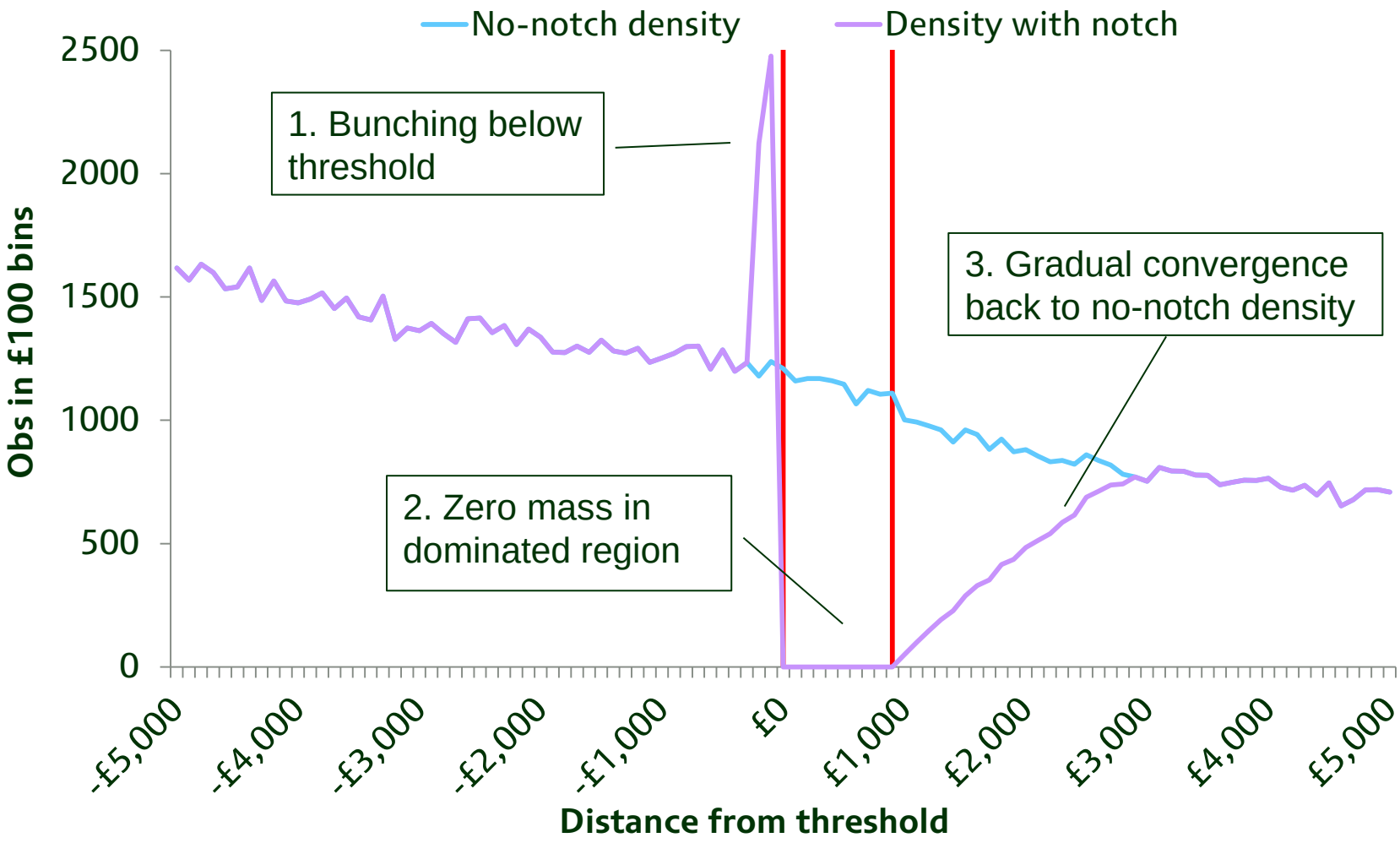
Bunching at kink points in the tax system

- With smooth distribution of convex preferences, individuals should bunch sharply at (convex) kink points in the tax system
  - Amount of bunching proportional to size of compensated elasticity
- Saez (2010) derives method to estimate the excess mass (bunching) at a kink point and use this to compute the ETI
- But adjustment costs and optimisation frictions mean some individuals don't bunch
  - Attenuate any estimate of the ETI obtained from bunching
  - Can't distinguish low ETI from high adjustment costs
- Bunching at notches allows us to say more…

Creates dominated region no one should locate in



Add note with years etc

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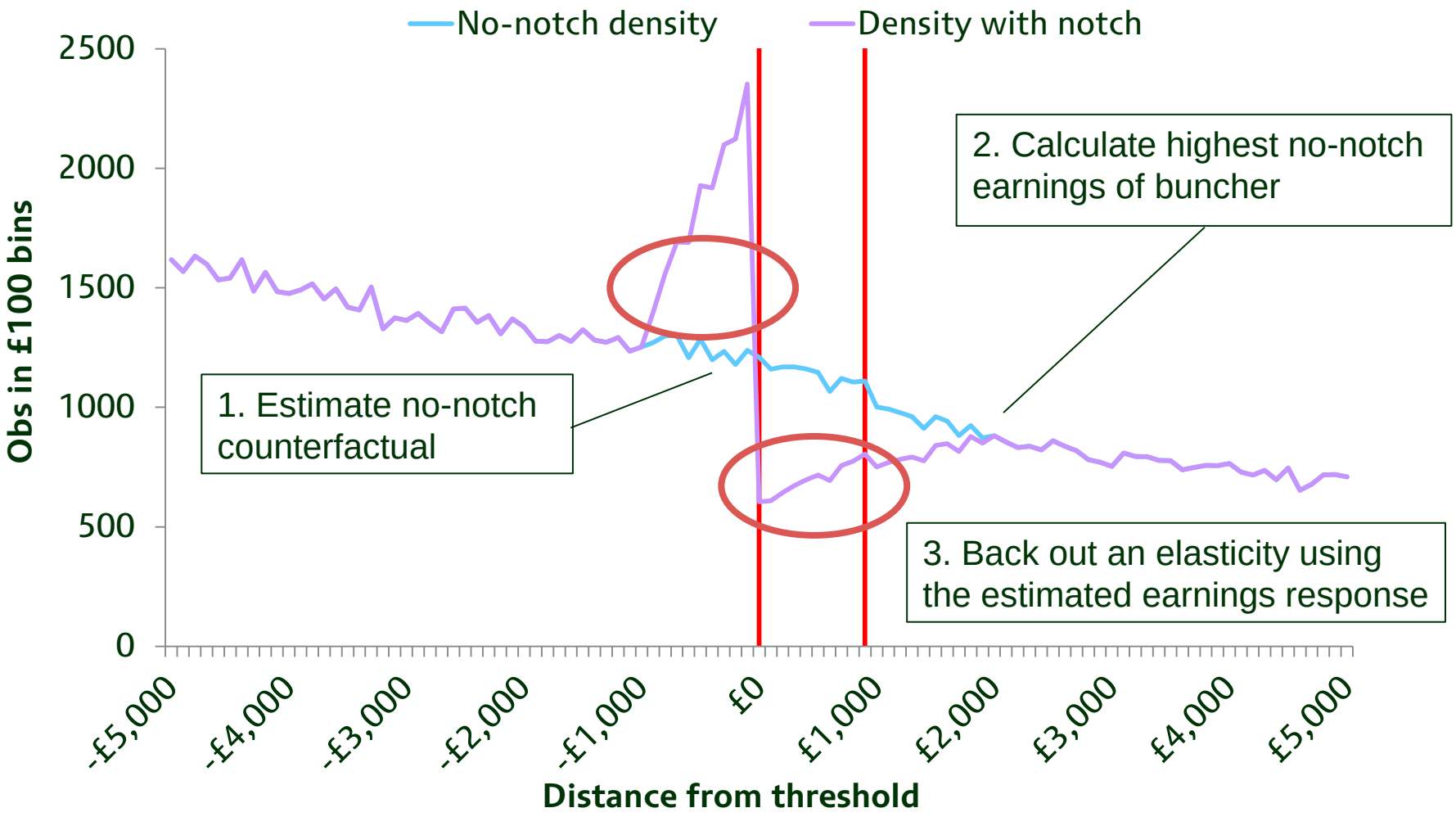
And allows us to estimate unattenuated elasticity



Add note with years etc

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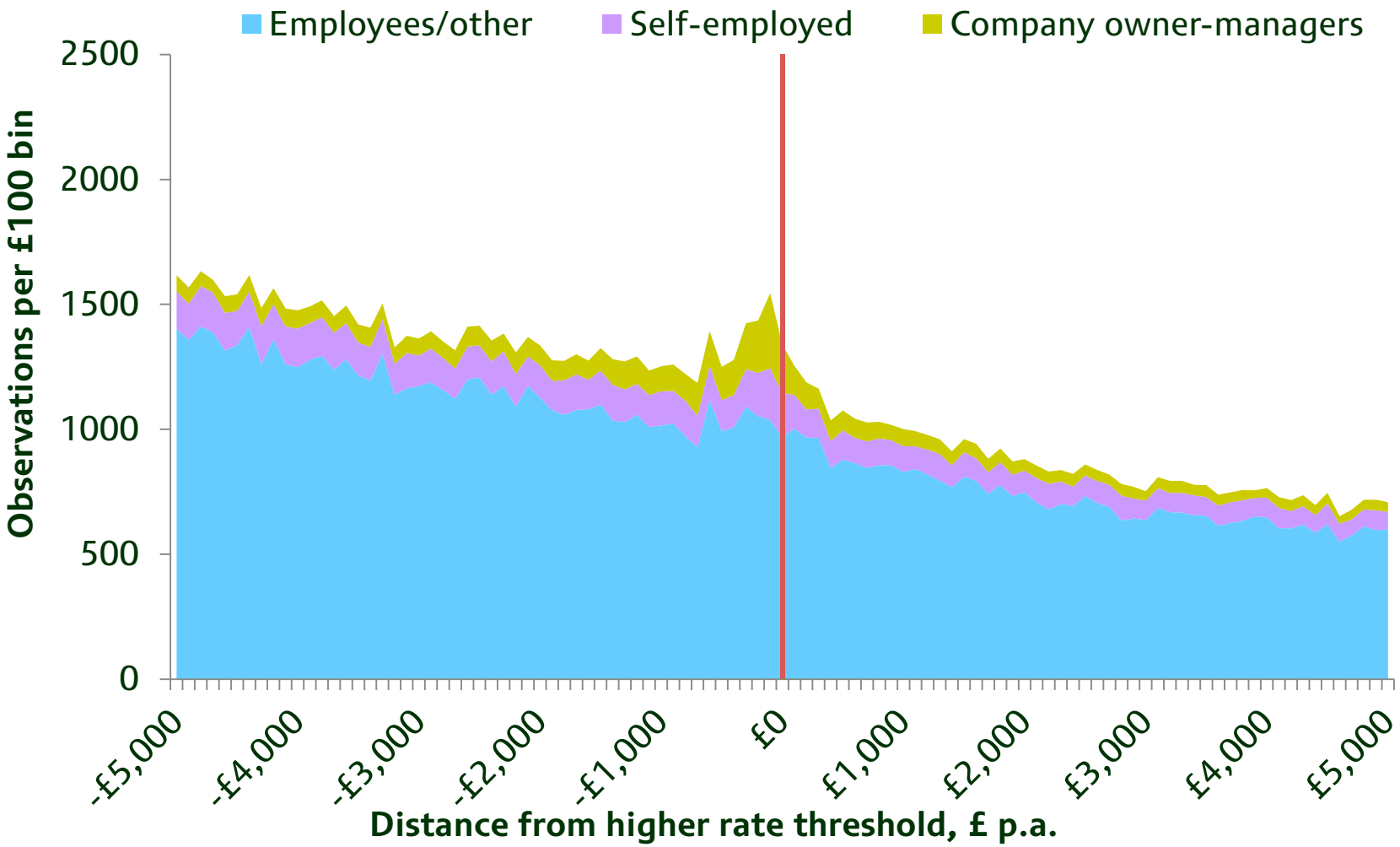
Estimate ETI using large UK admin datasets

- Survey of Personal Incomes (SPI): 2003-2011
  - Sample of income tax administrative records (~700,000 observations)

- New Earnings Survey (NES): 1978-2008
  - Large mandatory employer survey (psuedo-admin data) targeting 1% random sample of civilian employees
  - Gives earnings in relevant period for NICs, but some issues:
  1. Incomplete sample below LEL: we might understate bunching
  2. Earnings reported for period around turn of fiscal year: not sure whether response is short/long-run, and which year's threshold applies

Bunching at HRT mostly company owner-managers



Note: All figures in 2007–08 prices.
Source: 2003–04 to 2007–08 SPI.

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… and implies very small elasticities

Table 3, Panel B

Kink	All taxpayers	Self-employed	Company owner-managers	Other taxpayers
Higher rate threshold	0.032***	0.058***	0.246***	0.015***
£100,000				
£150,000				

Note: ** = statistically significant at 5%, *** = statistically significant at 1% level.
Source: Author's calculations using 2003–04 to 2007–08 Survey of Personal Incomes.

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£150,000	0.022***	0.011	0.070***	0.015***

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Source: Author's calculations using 2003–04 to 2007–08 Survey of Personal Incomes.

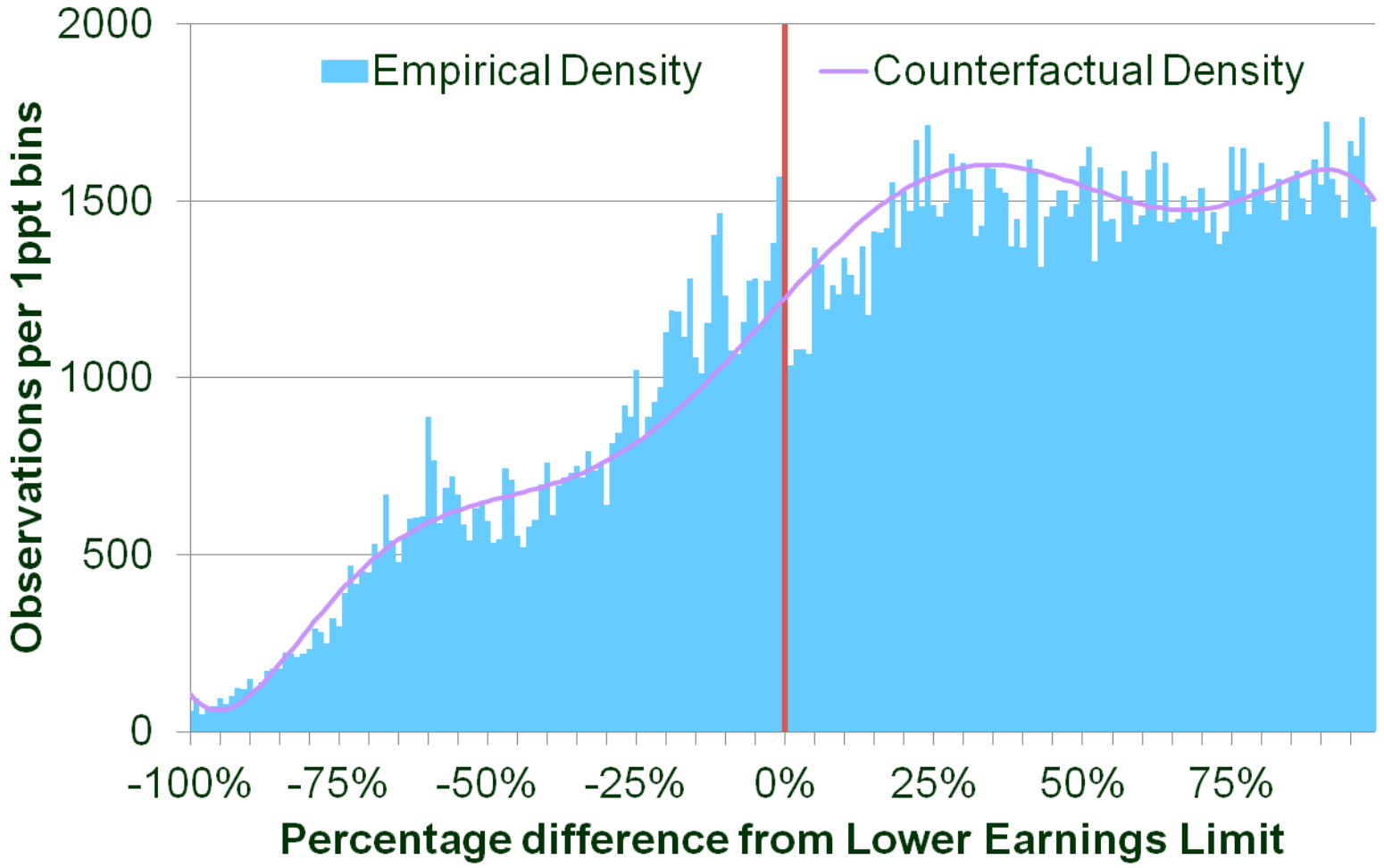
Though adjustment costs could explain this

- Estimates consistent with much larger elasticities if we allow for adjustment costs/optimisation frictions
  - Using Chetty (2012) approach, 'all taxpayers' estimate of 0.03 consistent with a ETI of up to 0.54 if adjustment costs = 1% income

- See no bunching at all at kink points in NICs schedule post-99
  - Smaller kink points so less incentive to bunch than at HRT

Do see bunching at the LEL over period 1978-85

Figure 8a



Source: Authors' calculations using New Earnings Survey.

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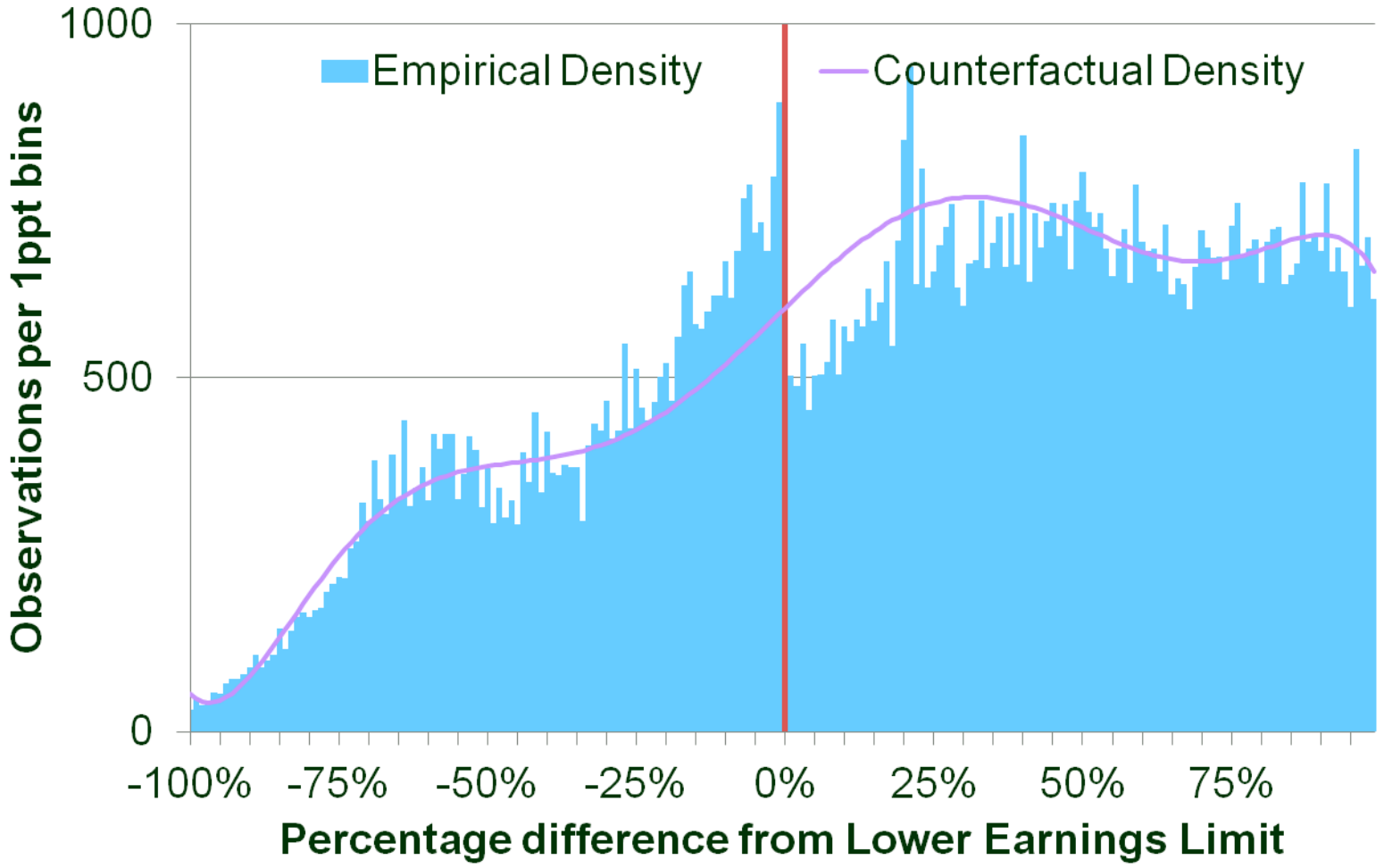
… which gets sharper between 1986-89

Figure 8b



Source: Authors' calculations using New Earnings Survey.

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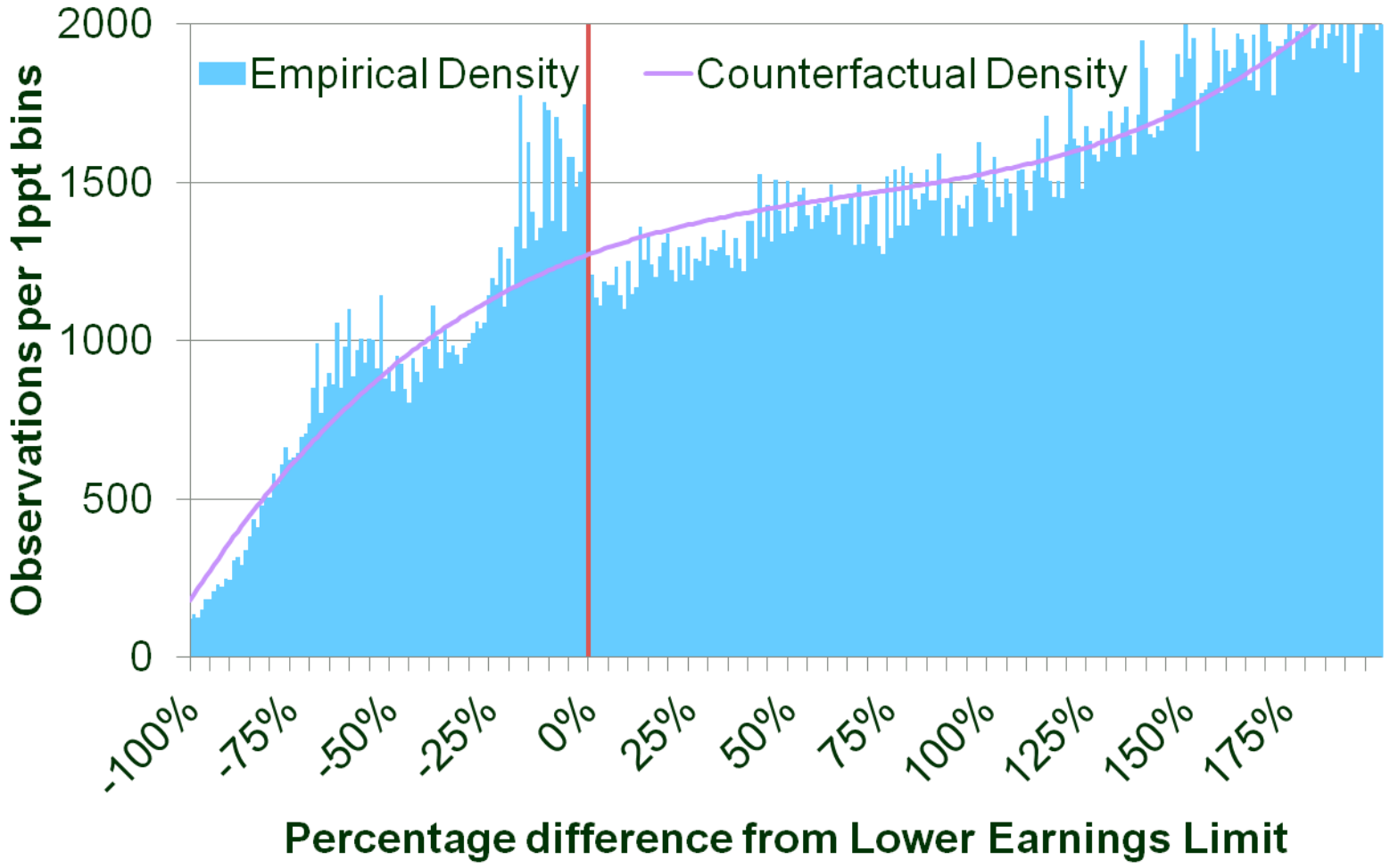
… and remains strong from 1990-99

Figure 8c



Source: Authors' calculations using New Earnings Survey.

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Can estimate unattenuated elasticity at this notch

Table 2, Panel A

Time	Reduced-form approach		Structural approach	
	Convergence method	Bunching-hole method	Convergence method	Bunching-hole method
1978-85	0.3214 *(0.0030)*	0.4633 *(0.0067)*	0.1600 *(0.0027)*	0.2918 *(0.0081)*
1986-89				
1990-99				

Note: Bootstraped standard errors in italics calculated drawing with-replacement from the observed distribution.
Source: Author's calculations using New Earnings Survey, 1978-1999

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1986-89	0.5498 (0.0046)	0.5988 (0.0079)	0.4108 (0.0042)	0.4580 (0.0065)
1990-99				

Note: Bootstraped standard errors in italics calculated drawing with-replacement from the observed distribution.
Source: Author's calculations using New Earnings Survey, 1978-1999

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1986-89	0.5498 (0.0046)	0.5988 (0.0079)	0.4108 (0.0042)	0.4580 (0.0065)
1990-99	1.5683 (0.0121)	2.3906 (0.0742)	1.3200 (0.0117)	2.1387 (0.0781)

Note: Bootstraped standard errors in italics calculated drawing with-replacement from the observed distribution.
Source: Author's calculations using New Earnings Survey, 1978-1999

But interpret these estimates with caution…

- Some estimates sensitive to way in which counterfactual drawn
- Data issues mean understate bunching
- Combination of methods gives wide range of estimates (not bounds)
- Local estimate for particular group from quite some time ago

Sub-groups

- Women (especially part-time) much more responsive than men
- Longer-tenured employees somewhat more responsive
- Bunching concentrated in certain sectors e.g. retail, hospitality

Don’t see any bunching at notches above LEL

- Suggests that adjustment costs could be substantial
  - Locating in dominated region => losses of 2-4% of total gross earnings for both employees and employers
- … and/or that these notches are less salient than LEL notch
- … and/or that jump in admin costs for firms is lower than at LEL

Conclusions (1)

- See some bunching at the HRT, but implied elasticities very small
  - … except for company owner-managers (0.25) who drive the bunching
  - Probably attenuated by adjustment costs or frictions
- No real evidence of bunching at other kinks
- Some bunching at notch where NICs become payable
  - Allows us to estimate non-attenuated elasticities of order 0.20-0.60
  - … though method in places sensitive to particular specification + data
- No bunching at notches above LEL
  - Adjustment costs substantial for most employees (and firms)
  - Consistent with models that incorporate hour constraints?

Conclusions (2)

- Owner managers & part-time women most responsive
  - Owner-managers can easily change timing of dividend income
  - Part-time employees more easily able to adjust hours
  - Heterogeneous adjustment costs may help explain pattern of results in literature e.g. larger estimates of ETI for women?

- More bunching at post-85 despite smaller notch
  - Salience effect?

- Little bunching at 100k or 150k thresholds:
  - 60% rate less salient?
  - Both new: takes time for taxpayers to learn how to game the system?

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