Taxpayer responsiveness to marginal tax rates: Bunching evidence from the Australian personal income tax system

September, 2017

Shane Johnson and Robert Breunig
robert.breunig@anu.edu.au

Elasticity of taxable income

- Comprehensive measure of taxpayer response to the tax system
  - Labour supply responses
  - Tax minimisation responses
  - Tax avoidance
- Key parameter to inform optimal design of tax policy
- Sufficient parameter, under some circumstances, to examine efficiency and optimality of tax system

Elasticity of taxable income

Defined as the response of taxable income, z, to variations in the net of tax rate $(1 - \tau)$

$$\varepsilon(z) = \frac{\Delta z}{z} / \frac{\Delta \tau}{(1 - \tau)} \tag{1}$$

Data

- Universe of taxpayer records from 1999-2000 to 2013-2014
- Includes all Australians who lodged tax returns during this period
- Over 160 million observations

Data

The data includes detailed administrative data on anything related to an individual's tax liability.

It also contains some limited demographic information

1. gender
2. age
3. occupation
   not wholly reliable
4. marital status
   reliable from 2000 through 2004 and again from 2013 onwards

Key results

- Statistically significant bunching at all notches in the Australian tax system
- Elasticities range from around zero to 0.26
- Highest elasticities for self-employed tax filers at the top notch in the system
- Significantly higher elasticities for married women; women with children; younger tax filers
- Elasticities appear to decrease over time

Literature

A few papers worth noting

- Feldstein (1999)
  Seminal paper
- Saez, Slemrod and Giertz (2012)
  Comprehensive review
- Saez (2010) and Chetty, Friedman, Olsen and Pistaferri (2011)
  Similar methodological approach using bunching

Literature

Saez (2010)

- Analyzes bunching around kink points in the US federal tax system and kinks created by the EITC
  - Finds bunching at EITC phase-in point for self-employed tax files
  - Bunching at first kink point where tax-free threshold ends (elasticity of 0.2)
  - No bunching at other kink points, even at top of rates and even for self-employed

Literature

Chetty et al. (2011)

- Uses universe of Danish tax records
- Bunching only at top tax rate where there is a 30% drop in the net of tax wage rate
- While there is bunching, elasticity is effectively zero
- No bunching at pension kink or at 2nd notch in tax system
- Elasticity of 0.24 for self-employed tax filers at top notch

Other empirical studies

- Le Maire and Schjerning (2013)
  Danish data
- Bastani and Selin (2014)
  Swedish data
- Kleven and Waseem (2013)
  Pakistani data

Methodology

Key assumptions:

1. Utility maximising consumers facing a quasi-linear budget constraint given by

$$c = z - T(z) \tag{2}$$

   where $T(z)$ is the personal income tax schedule
2. Taxable income z is distributed according to a smooth density function $h_0(z)$
3. Common elasticity parameter for all taxpayers

Key idea

Suppose that

$$T(z) = \tau_1 z \tag{3}$$

A new tax schedule is introduced where income above z^* is taxed at higher rate, τ_2. Now tax schedule becomes:

$$T(z) = \tau_1 z^* + \tau_2 (z - z^*) \tag{4}$$

Budget constraint is convex above the kink point.

All individuals above the kink point will want to reduce their taxable income

Key idea

Taxpayers with incomes between $z^* + \delta z^*$ will want to reduce their income to z^*, but no lower.

Without optimization frictions, this will create a mass of tax filers who bunch precisely at the kink point:

$$B = \int_{z^*}^{z^*+\delta z^*} h_0(z)dz = h_0(\zeta)\delta z \tag{5}$$

for some $\zeta \in [z^*, z^* + \delta z]$.

We can use this equation to estimate the elasticity, following Saez (2010).

Other notes

- Focus on behaviour of individuals close to the kink point. Average tax rates are thus unchanged even though marginal tax rates are changing.
  No income effects
- Optimization might be imperfect as individuals can't precisely control their taxable income
- We allow asymmetry within the bunching window
- Bootstrap standard errors

Australian Tax System

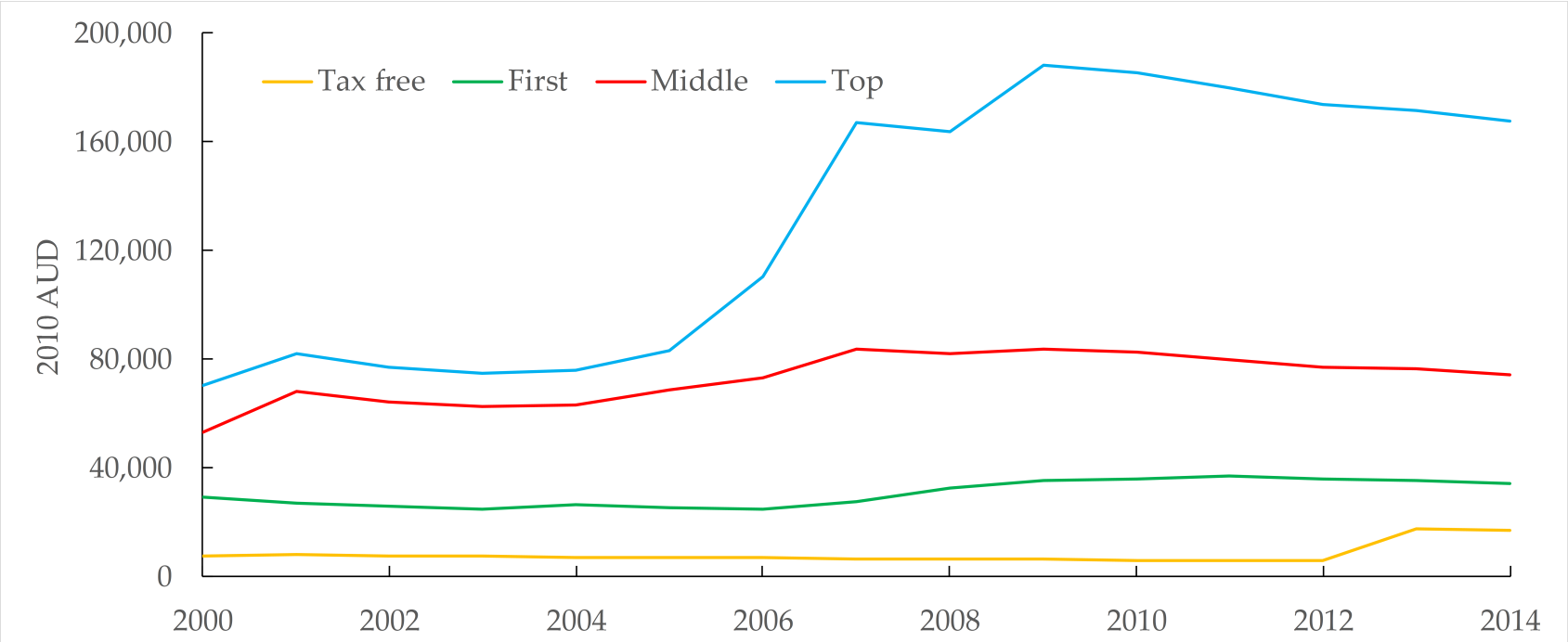


Figure: Income tax thresholds (real 2010 AUD), 2000 to 2014

Distribution of taxable income

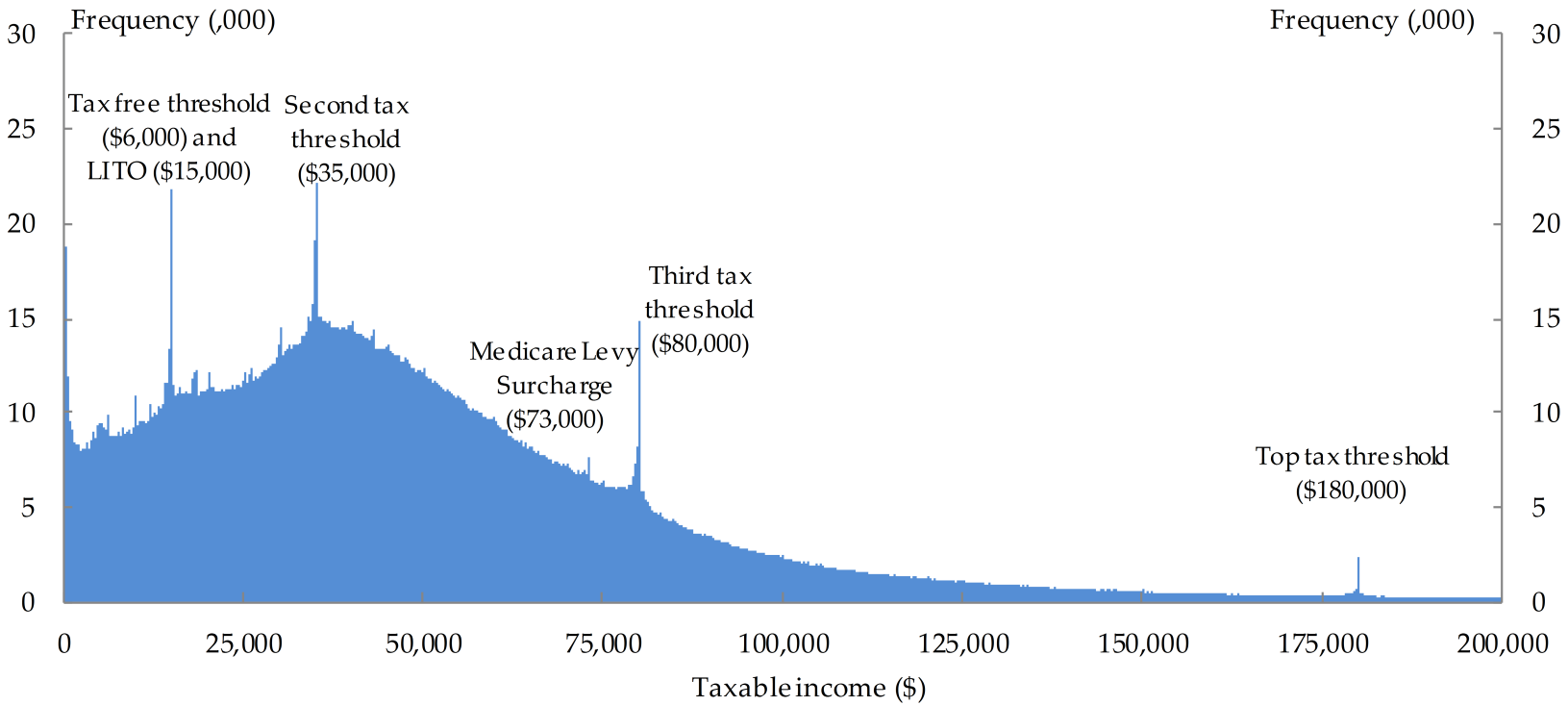


Figure: Distribution of taxable income, 2010

We examine four thresholds

1. Tax-free threshold
2. Second tax threshold
3. Third tax threshold
4. Top tax threshold

Two important assumptions

1. Taxpayers must understand the system and be aware of the tax schedule they face.
2. Distribution is smooth in the basence of any jumps in the marginal tax rate

We can learn about both of these by comparing histograms over time.

Comparing 2008 and 2009

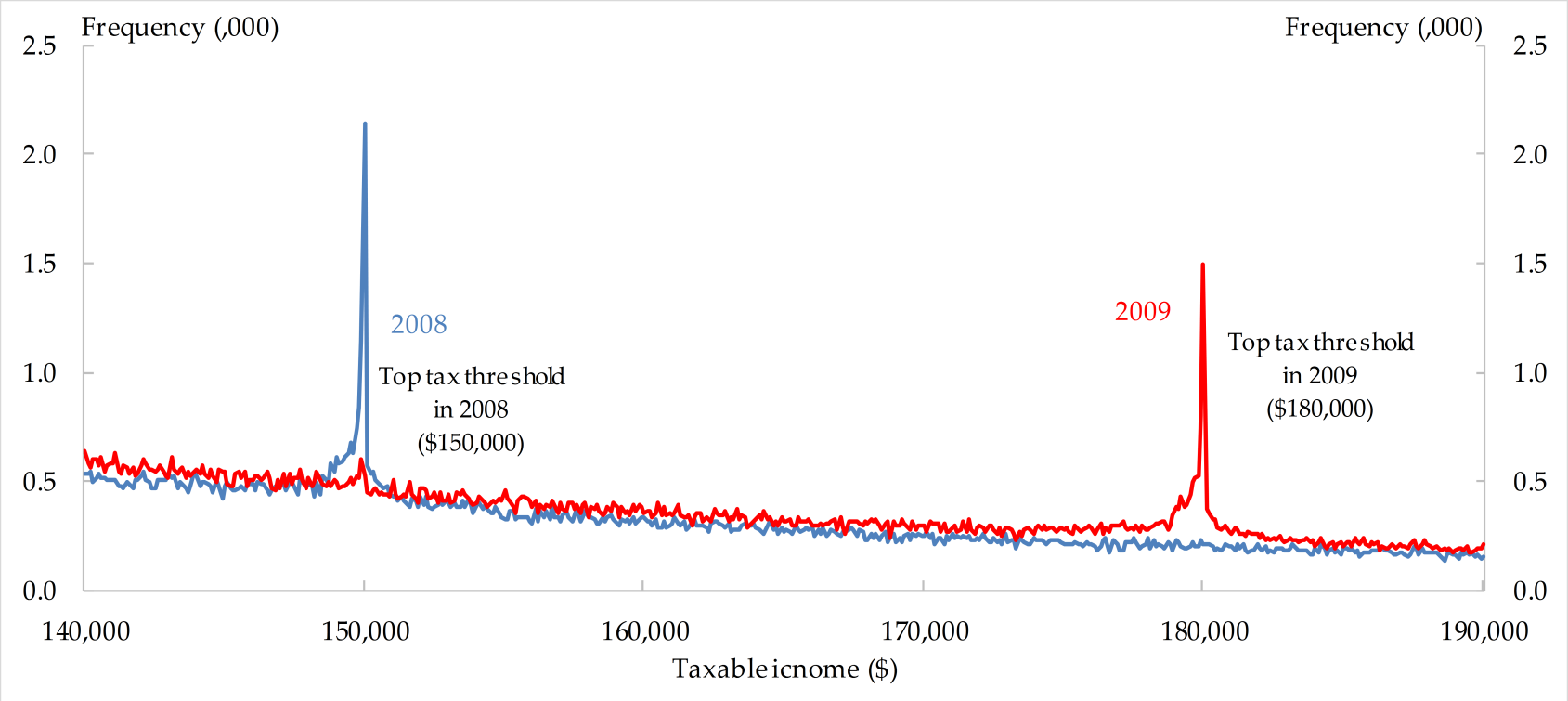
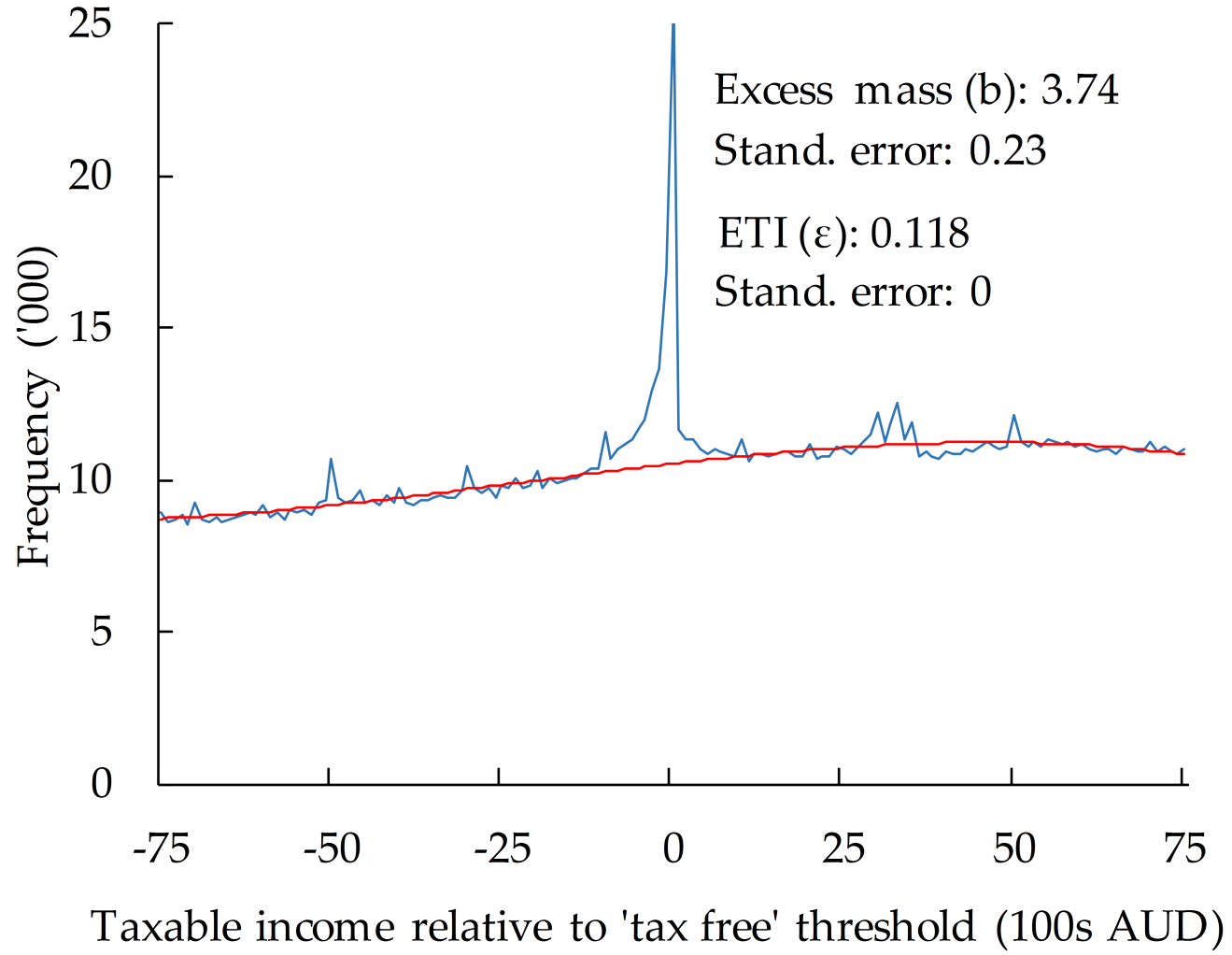
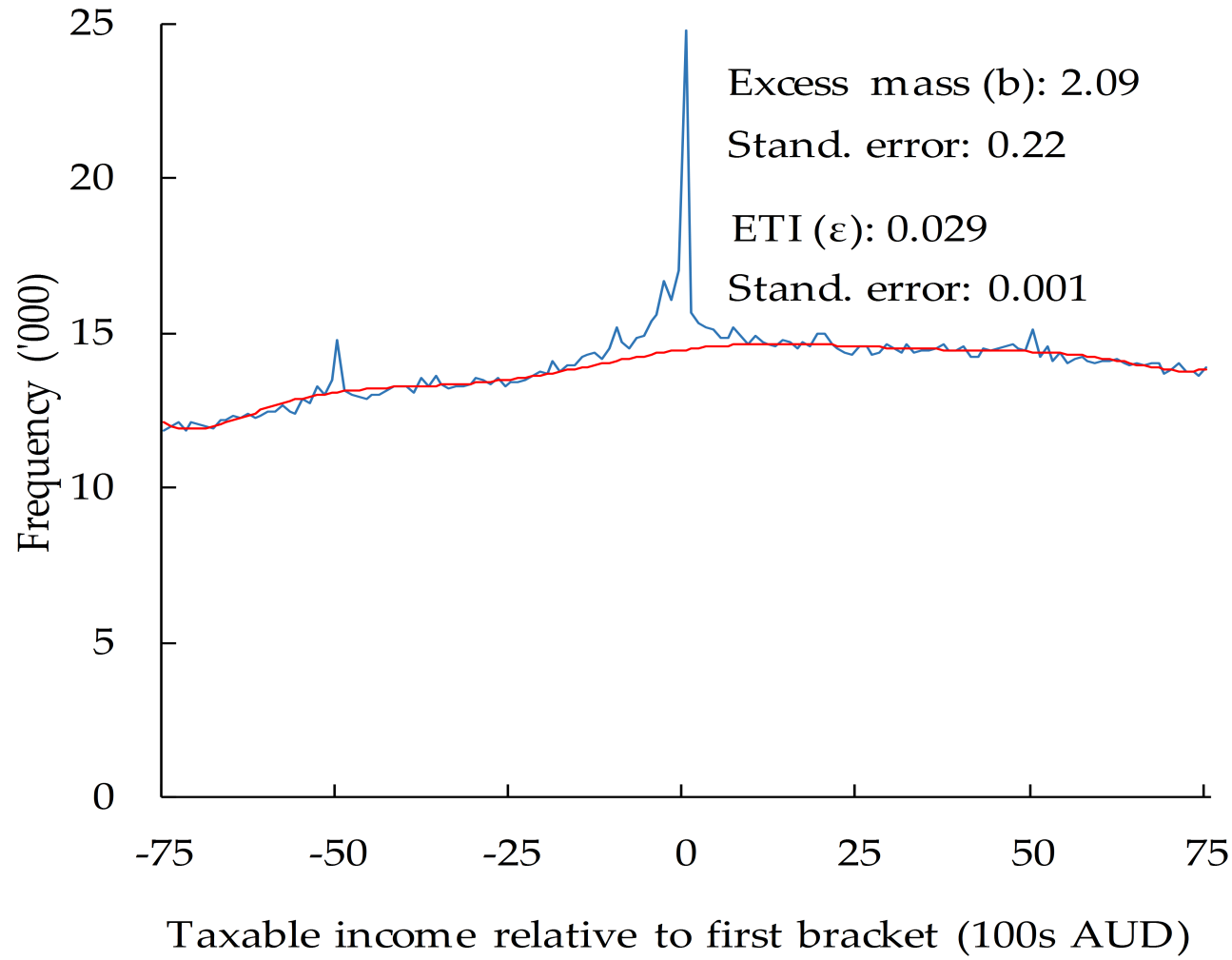


Figure: Distribution around top threshold, 2008 and 2009

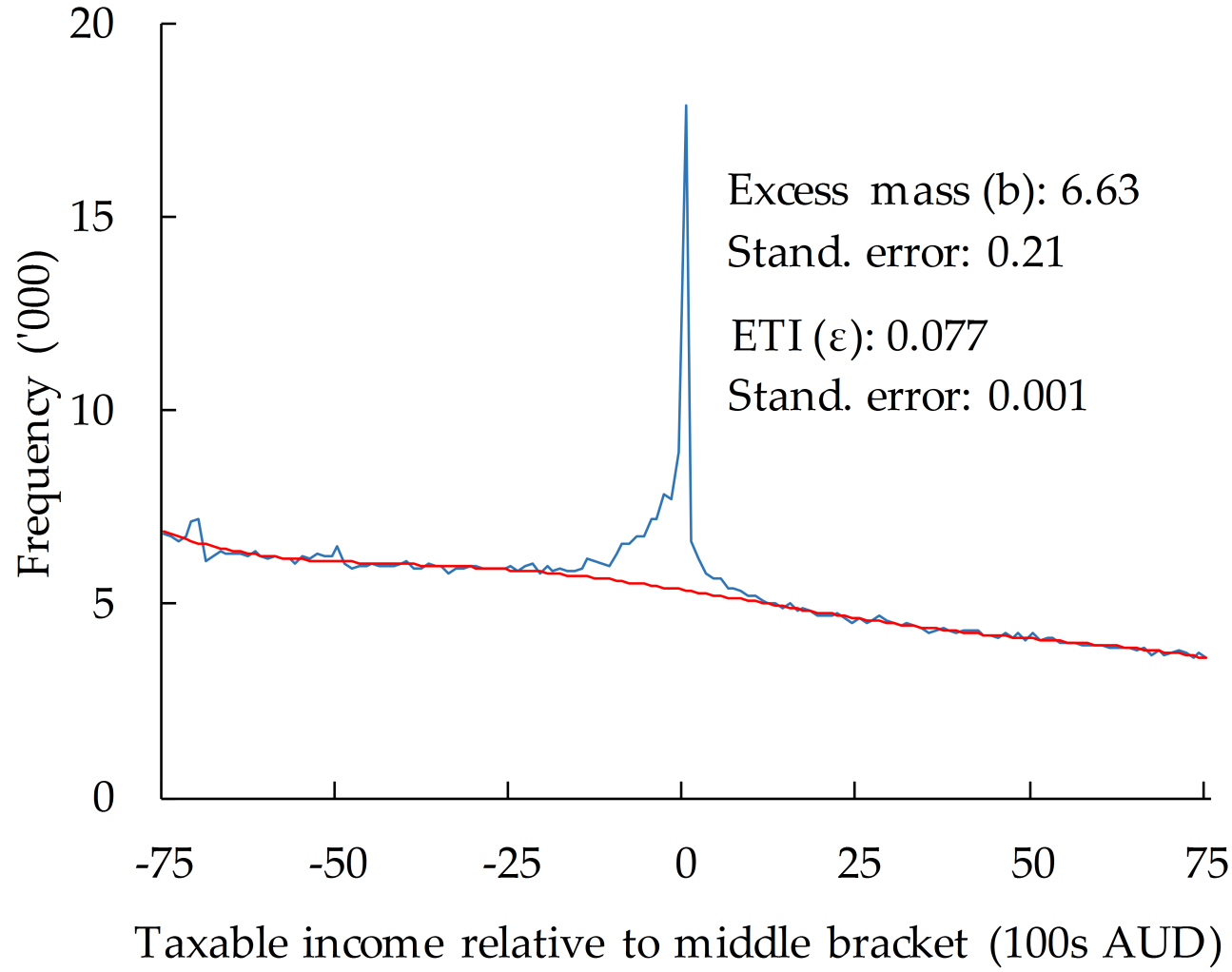
Bunching around first (tax free) threshold



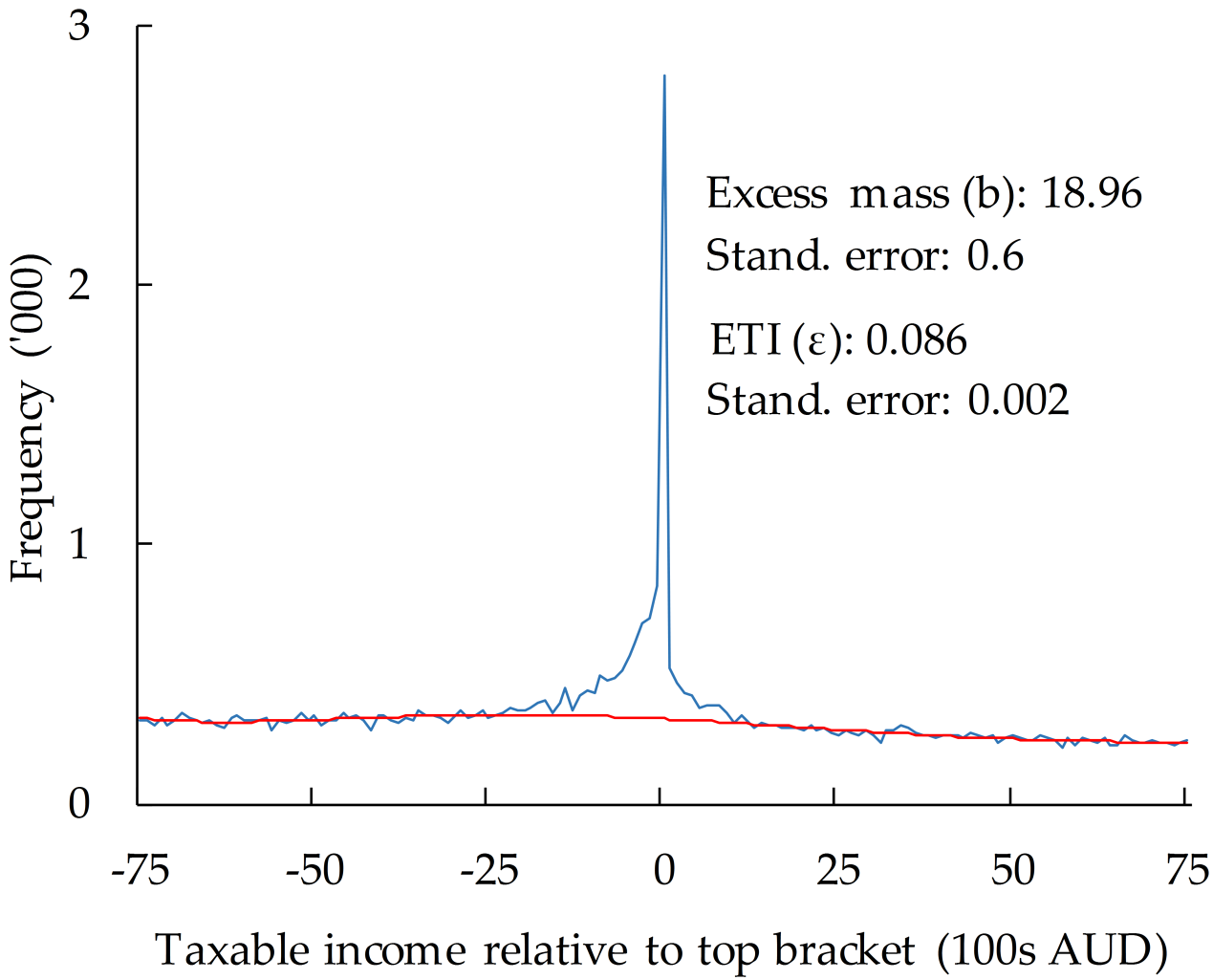
Bunching around second threshold



Bunching around third threshold



Bunching around top threshold



ETI comparisons

	All taxpayers	Wage earners	self-employed
Second threshold	0.029	0.003	0.086
	(0.001)	(0.001)	(0.003)
Third threshold	0.077	0.007	0.263
	(0.001)	(0.001)	(0.003)
Top threshold	0.086	0.006	0.152
	(0.001)	(0.001)	(0.004)

Gender

Given the literature on female labor supply, we might expect that married women with children are more responsive to the tax system than men.

- For wage earners, not much difference
- For self-employed, we find large effects, particularly at top threshold
  Self-employed women have higher elasticity of taxable income

Women with children

- Women with children more responsive than women without children
- Elasticities increase with number of children

Female tax filers, first threshold

Table: Female tax-filers, wage and salary earners, first threshold, 2013

	No children	1 Child	2 Children	3+ Children
Excess mass	0.29	0.39	1.01	0.80
	(0.064)	(0.128)	(0.137)	(0.212)
ETI	0.004	0.005	0.013	0.010
	(0)	(0.001)	(0.001)	(0.001)

Note: Standard errors in parenthesis.

Female tax-filers, self employed, first threshold, 2013

Table: Female tax-filers, self employed, first threshold, 2013

	No children	1 Child	2 Children	3+ Children
Excess mass	7.072	7.572	8.065	11.12
	(0.351)	(0.703)	(0.554)	(0.837)
ETI	0.091	0.098	0.104	0.144
	(0.002)	(0.003)	(0.003)	(0.004)

Note: Standard errors in parenthesis.

Female tax-filers, wage and salary earners, top threshold, 2013

Table: Female tax-filers, wage and salary earners, top threshold, 2013

	No children	1 Child	2 Children
Excess mass	2.286	1.78	3.967
	(0.793)	(1.56)	(1.682)
ETI	0.009	0.007	0.016
	(0.002)	(0.005)	(0.005)

Note: Standard errors in parenthesis.

Female tax-filers, self employed, top threshold, 2013

Table: Female tax-filers, self employed, top threshold, 2013

	No children	1 Child	2 Children	3+ Children
Excess mass	29.58	31.07	35.09	33.86
	(1.8)	(3.861)	(2.809)	(3.143)
ETI	0.118	0.124	0.14	0.135
	(0.005)	(0.011)	(0.008)	(0.009)

Note: Standard errors in parenthesis.

Trends over time

- ETI seems to fall over time for most thresholds and most taxpayers
- We see big effects of superannuation rules

Trends in ETI at second threshold

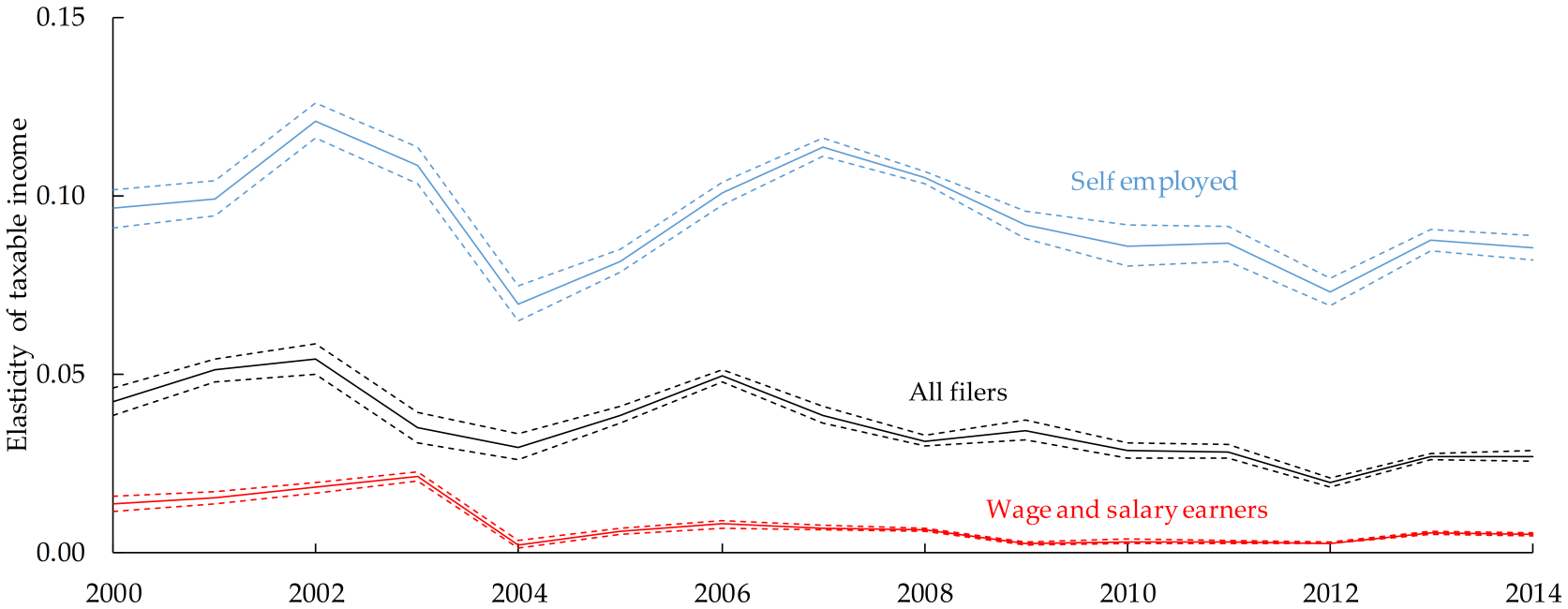


Figure: Observed elasticity of taxable income, first threshold, 2000-2014

Note: The dashed lines represent the 95 per cent confidence intervals.

Trends in ETI at top threshold

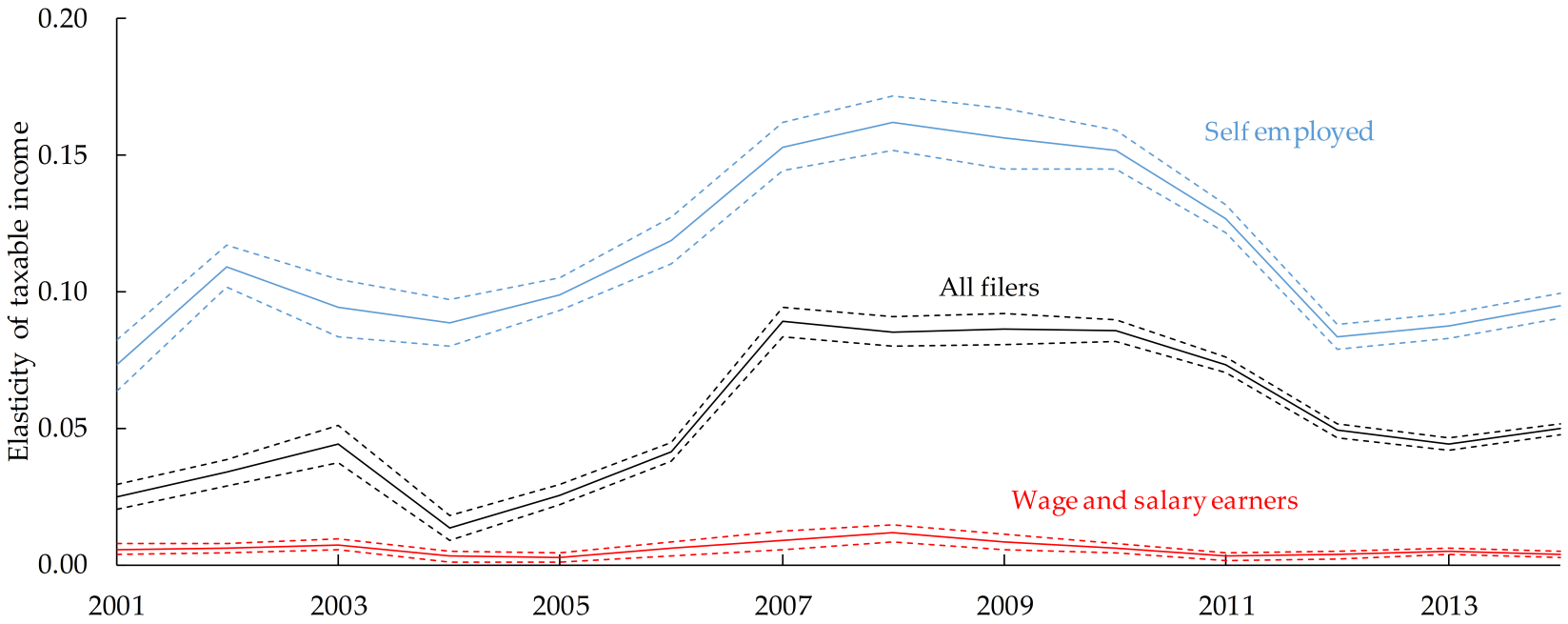


Figure: Observed elasticity of taxable income, top threshold, 2001-2014

Note: The dashed lines represent the 95 per cent confidence intervals.

Conclusions

- We find significant bunching at all thresholds
  In contrast to previous studies in US, UK and Scandinavia
- Estimates for all tax filers of 0.03 to 0.12
- Estimates for wage/salary earners of zero
- Estimates for self-employed generally over 0.1
  Up to 0.26 for third threshold
- Gender effects
- Effects of children
- Age effects
  Higher for younger tax filers
  May reflect risk-taking
  May reflect family tax planning
  May reflect lower attachment to labor market
- Changes over time

Policy implications

1. Important to use country-specific parameters for tax system design and analysis
2. Elasticity of taxable income (ETI) not a 'deep' parameter
3. Tax administration and taxpayer compliance activities can impact on ETI

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