Lecture 5: Labour income taxation (1)

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Master APE and PPD
Paris – October 2024

Labour income taxation

1. **Do tax cut pay for themselves ?**
   - Are we above the Laffer curve ?
2. **How to redistribute to the poor ?**
   - Do benefits lead to poverty traps ?
   - Does workfare works ?
3. **Should we introduce basic income/flat tax ?**
   - Is it utopia, nightmare or the future of tax design ?
4. **How much can we tax the rich ?**
   - Do high taxes on top incomes soak the rich or make everyone worse off ?

Outline of the lecture 5

I. **Incidence : who pays taxes ?**
   1. Theory
   2. Empirical estimates

II. **Labour supply responses**
   1. Structural labour supply estimates
   2. Quasi-experimental labour supply estimates
   3. Macro vs micro estimates

III. **Policy : Transfer to the poor**
   1. Traditional welfare
   2. Optimal transfer system
   3. Workfare or EITC-like policies

Outline of the lecture 6

IV. **Elasticity of taxable income**

1. Conceptual framework
2. Early ETI studies
3. Recent ETI studies

V. **Optimal labour taxation**

1. Conceptual framework
2. Mirrlees model
3. Generalized optimal labour taxation models

VI. **Policy : Taxing top incomes**

1. What top marginal tax rate ?
2. Issue of international mobility
3. Policy debate : supply side vs optimization vs rent seeking

History of income taxation

- **First attempts at general income taxation (18th c.)**
  - First discussion about measurement of national income
  - Attempts at general income taxation (Touzery, 1994)

    e.g., *taille tarifée* in France in 1715

- **Schedular income tax (19th c.)**
  - Different tax schedule by type of income

    e.g., land, farming, trades, pensions, etc.
  - Income tax, a British invention :
    - 1799 income tax by PM William Pitt the Younger
    - 1803 income tax by PM Henry Addington
    - 1842 income tax with PM Robert Peel
  - France income tax on capital income (*impôt sur le revenu des valeurs mobilières*) in 1872

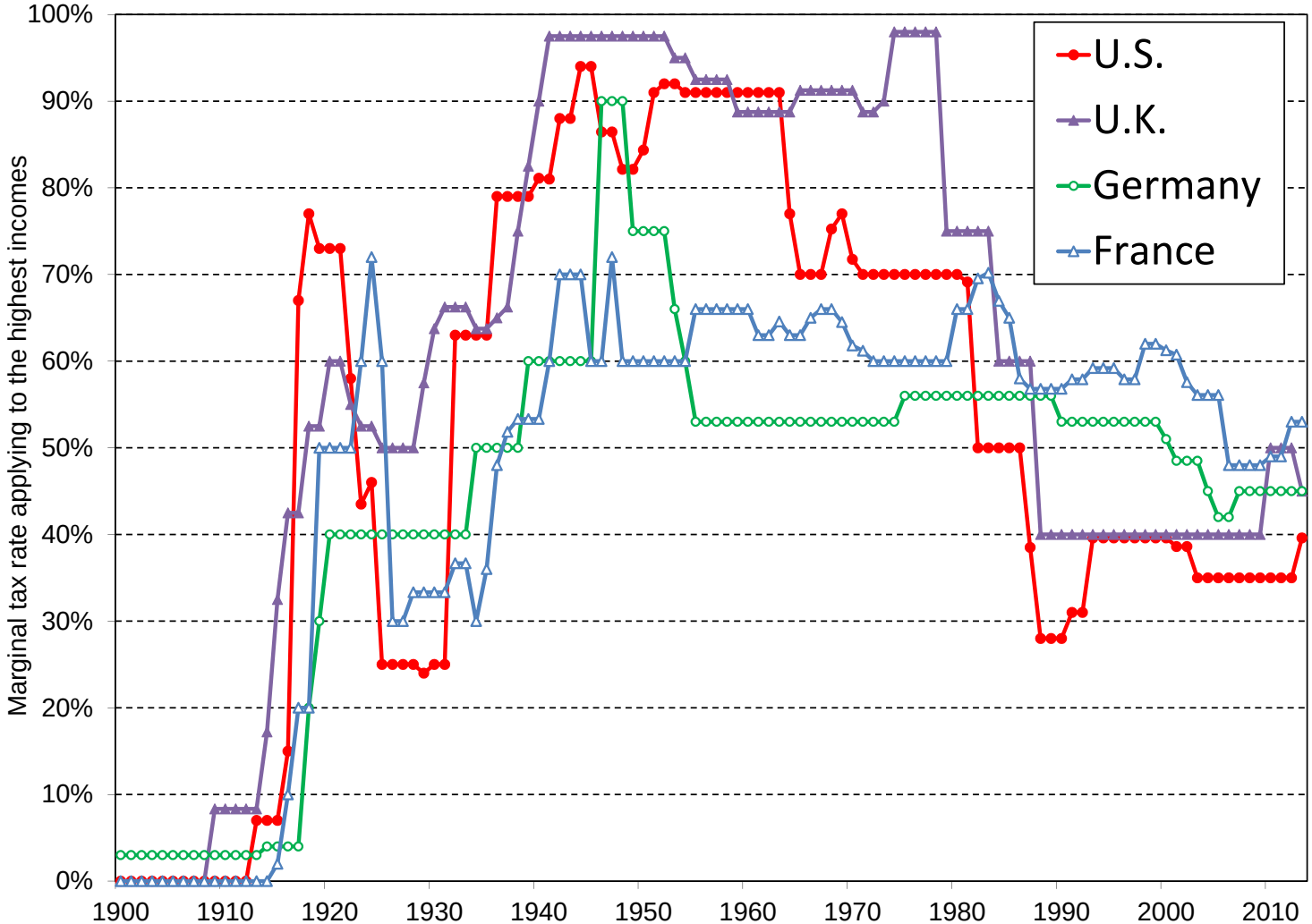
History of income taxation

- **First modern income taxes**
  - 1891 in Prussia
  - 1909 in the U.K.
  - 1913 in the U.S. (Mehrotra, 2013)
  - 1914 in France (Piketty, 2001 ; Delalande, 2011)

- **Comprehensive and progressive**
  - Comprehensive : all income sources taxed in the same tax schedule
  - Progressive : only on top incomes
  - But small : top marginal tax rates at 3%

- **Large increases with war efforts**
  - WWI : top marginal rates reached 40% to 70%
  - WWII : top marginal rates reached 70% to 97%

Figure 1 – Top marginal tax rates (1900–2013)

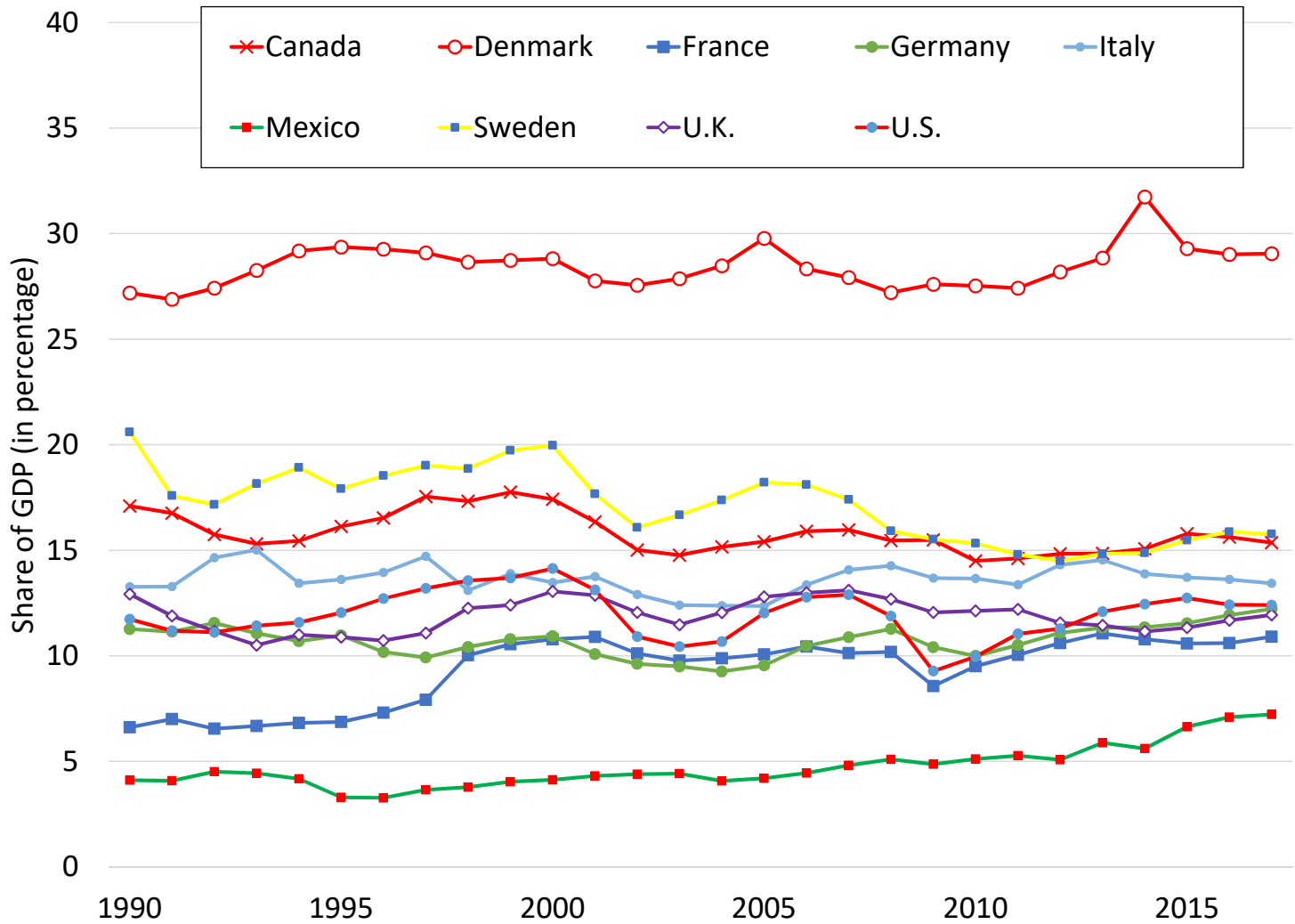


SOURCE : Piketty (2013), Fig. 14.1

Types of labour income taxation

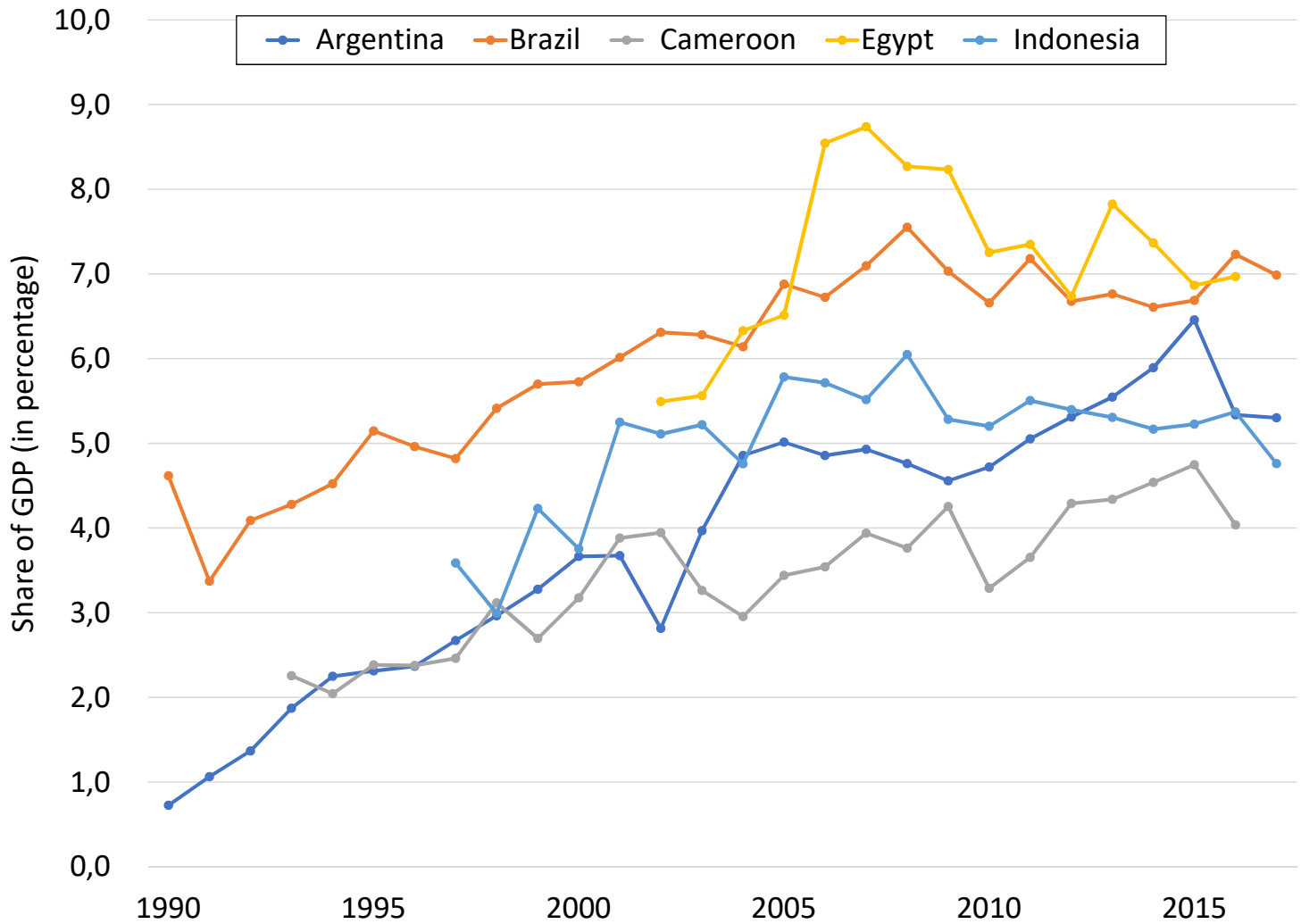
1. **Income tax**
   - Taxation of labour and capital income
   - Progressive tax : increasing average tax rate
2. **Social Security contributions (SSCs)**
   - Confer *entitlement* to receive a future social benefit
   - Taxation of earnings (not capital income)
   - Nominally split between employee and employers
   - Usually capped at threshold
3. **Means-tested benefits**
   - Assessed at household level
   - Child benefits, housing benefits, minimum income, etc.
   - Analysis similar to labour taxation

Figure 2 – Income tax as a percent of GDP, 1990–2017



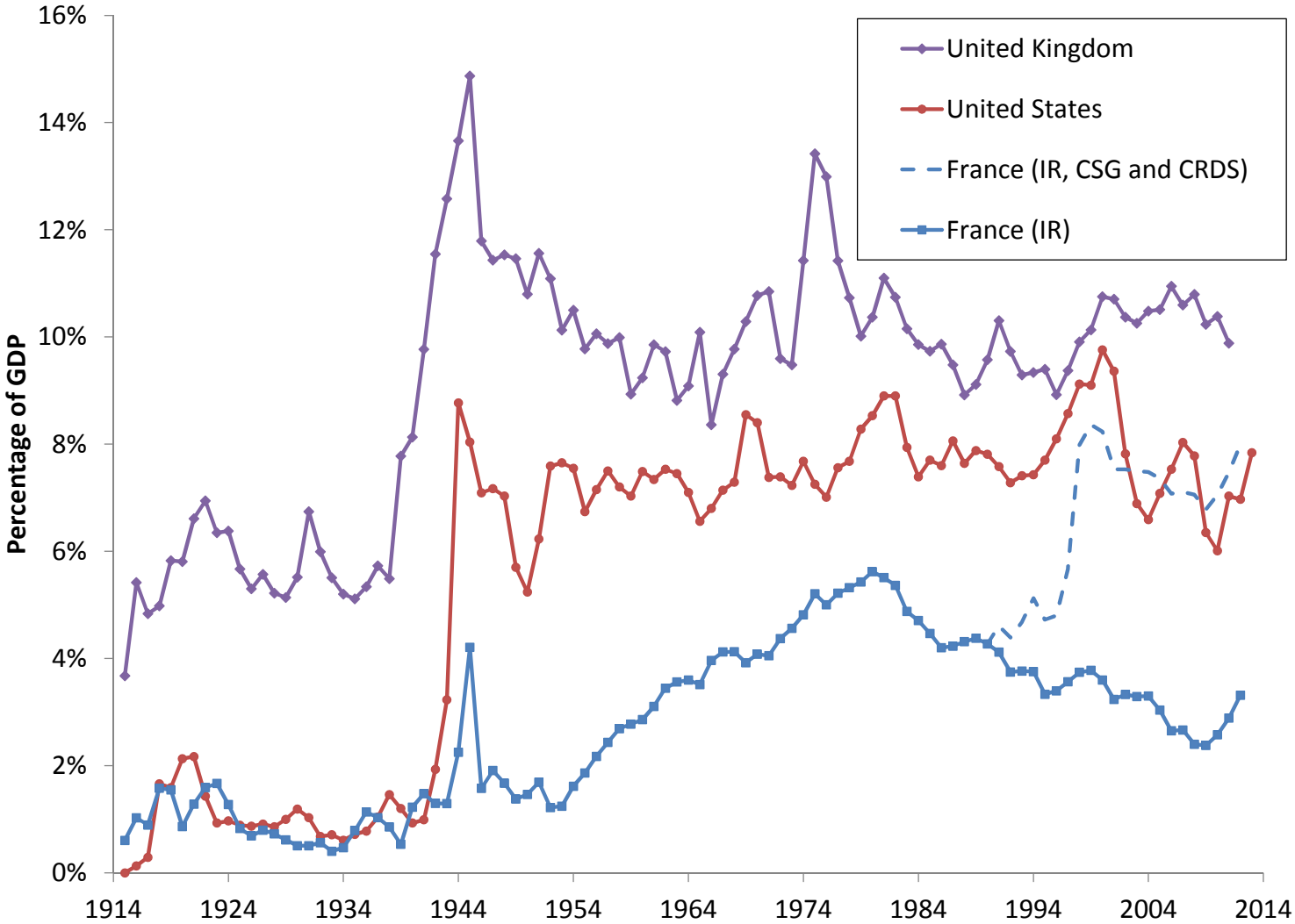
SOURCE : OECD.Stat

Figure 3 – Income tax as a percent of GDP, 1990–2017



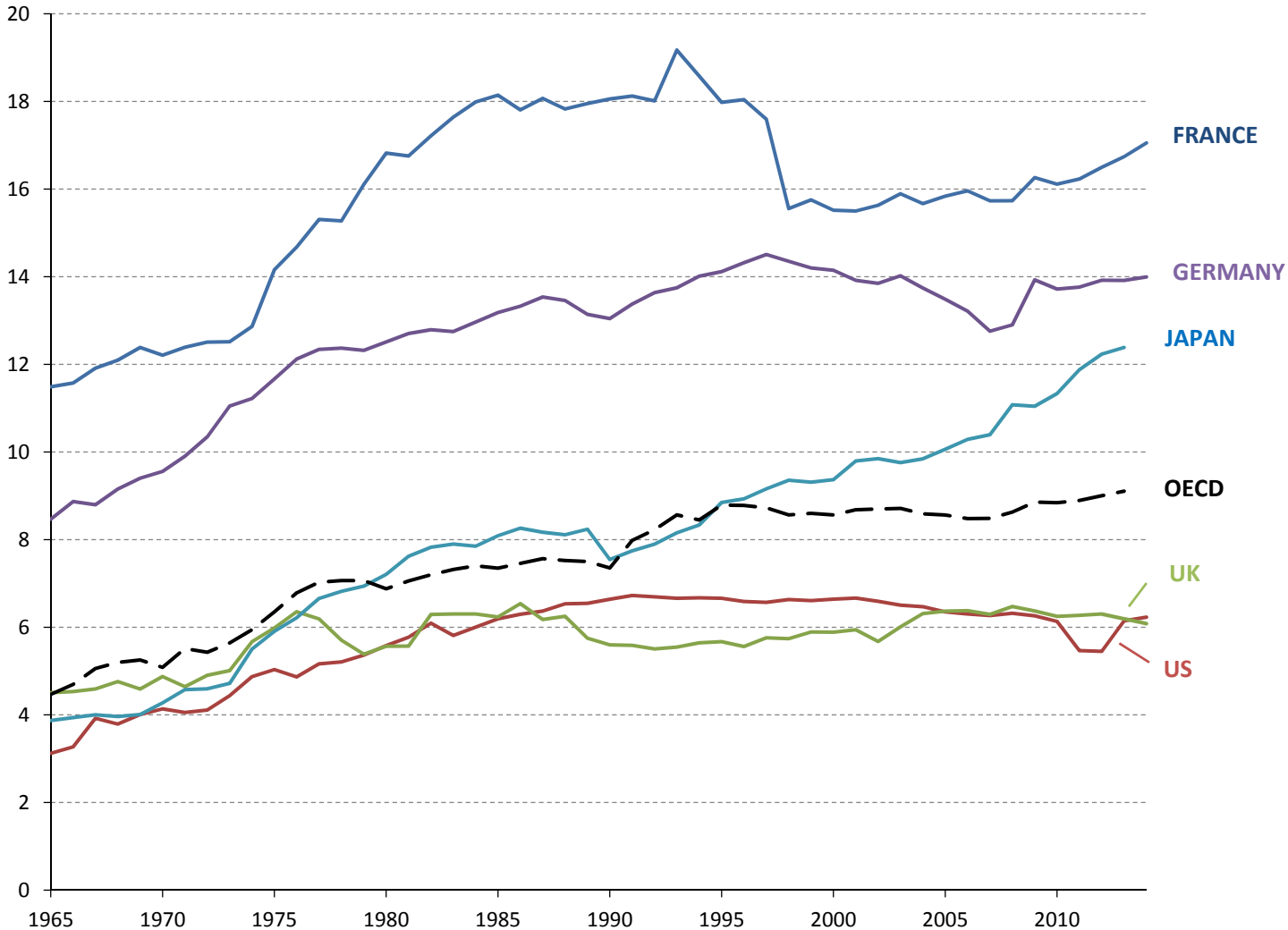
SOURCE : OECD.Stat

Figure 4 – Income tax as a share of GDP (1914–2014)



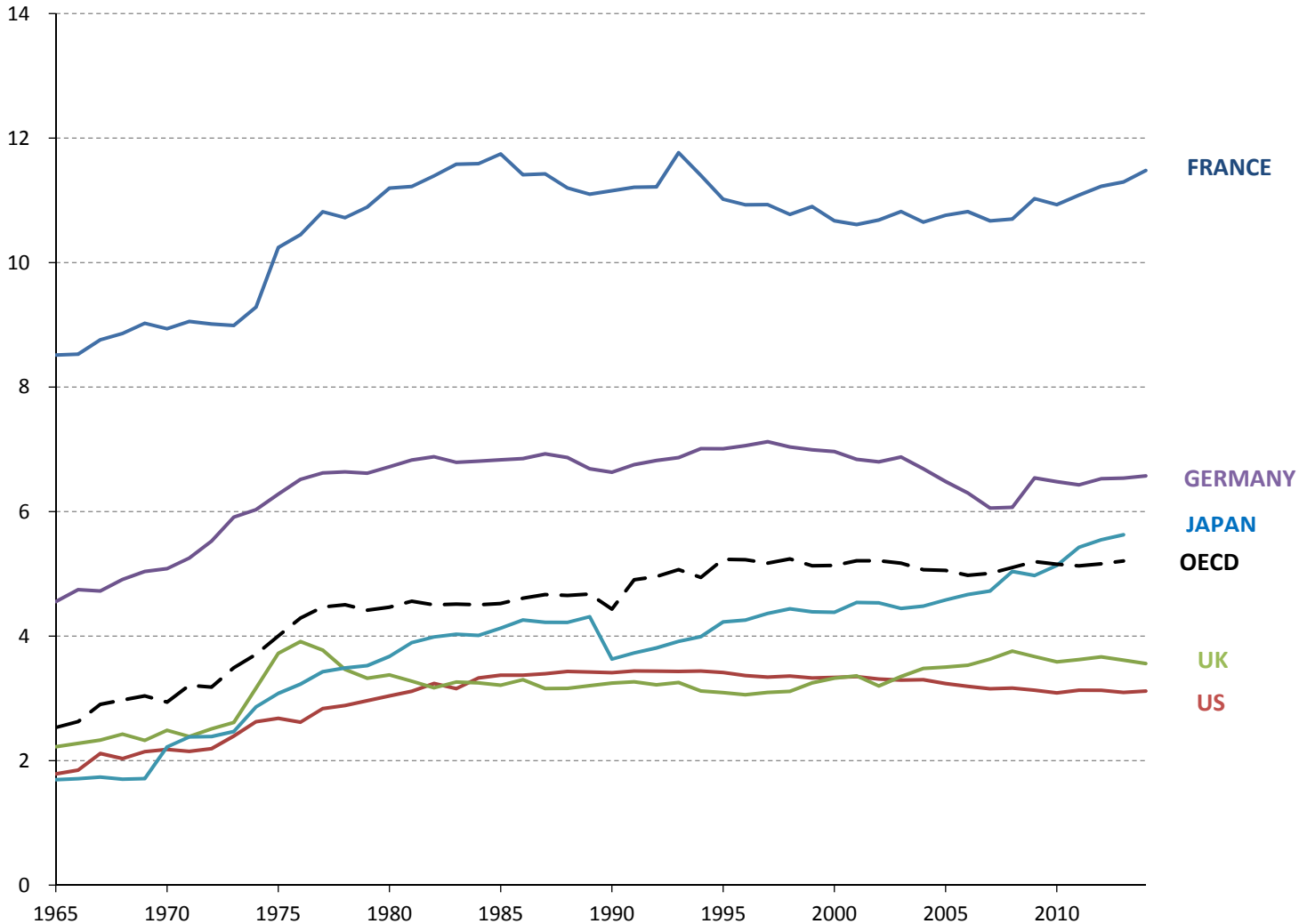
SOURCE : André and Guillot, *IPP Briefing Note*, No. 12, 2014.

Figure 5 – Social Security Contributions as a % of GDP, 1965–2014



Source : OECD.Stat

Figure 6 – Employer SSCs as a % of GDP, 1965–2014



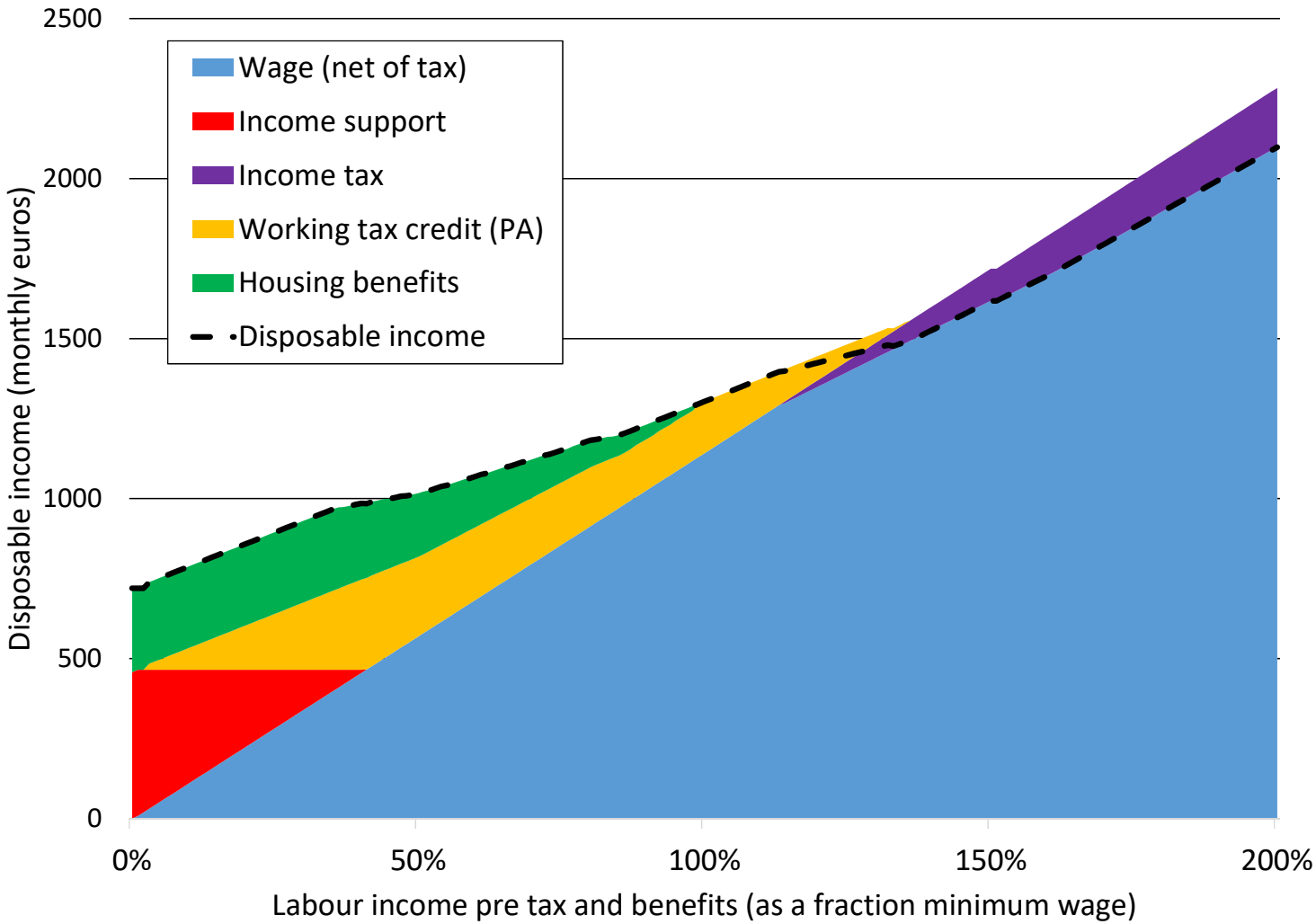
Source : OECD.Stat

Mean-tested benefits

- **Negative average taxation**
  - Benefits similar to tax credit
  - Negative tax payment
- **Marginal tax rates**
  - Means-testing means that additional euro earned is tax away

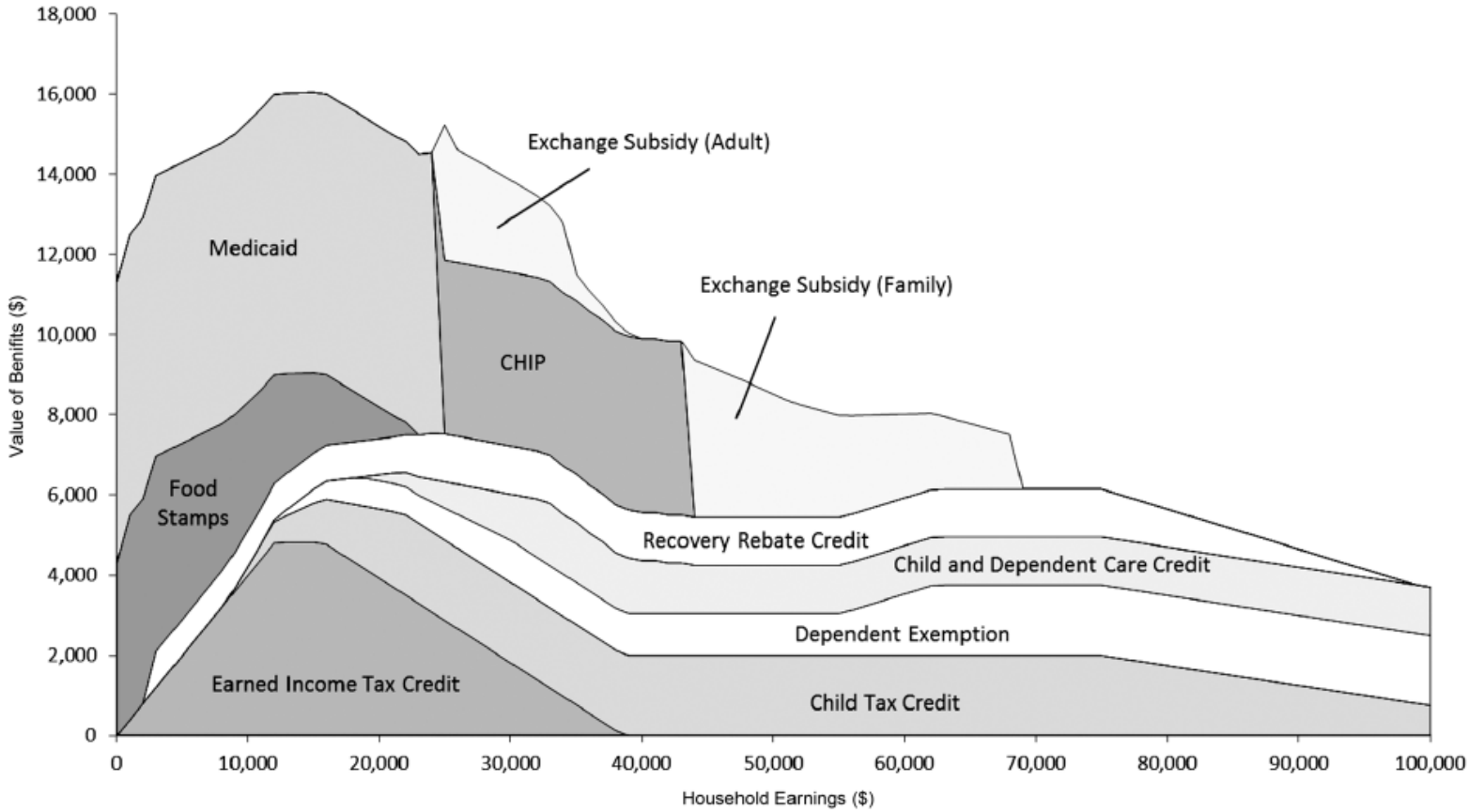
    e.g., 100% taper rate = 100% MTR
  - Common to find high MTR in benefit design
- **Budget constraints**
  - Representation of disponible income by hours worked
  - Slope is 1-MTR

Figure 7 – Budget constraint for French single earner (2014)



SOURCE : Ben Jelloul, Bozio, Cottet and Fabre, IPP, April 2017.

Figure 8 – Benefits for U.S. single earner and two children (2008)



SOURCE : Maag, Steuerle, Chakravarti and Quakenbush (2012), Fig. 1.

I. Incidence : Who pays taxes ?

1. Conceptual framework with tax-benefit linkage
2. Empirical evidence for employer SSCs
3. Evidence for income tax and benefits

Conceptual framework with tax-benefit linkage

- Standard general equilibrium model of tax incidence with competitive markets (Feldstein, 1974)

- **Labour demand**
  - Production function $F(.)$ is assumed to be homogeneous of degree one with two types of workers T and C.
  - Labor cost : $z_k = w_k(1 + \tau_k)$
    w_k : posted wage
    τ_k : payroll tax rate on employers
  - σ : elasticity of substitution between workers

- **Labour supply with tax benefit linkage**
  - $\tilde{w}_k \equiv w_k(1 + q\tau_k)$ the perceived wage of workers of type k
  - q : extent to which employees value employer contributions
  - η^S : elasticity of labor supply

Pass-Through Formula

- **Pass-through ρ of employer SSCs to the wage of treated workers relative to control workers**

$$\rho = \frac{\mathrm{d} \ln \left(\frac{w_T}{w_C} \right)}{\mathrm{d} \ln \left(1 + \tau_T \right)} \approx -\frac{\sigma + \eta^S \cdot q}{\sigma + \eta^S}$$

- **Three polar cases** :
  (1) Full linkage ($q = 1$) $\Rightarrow$ full shifting to workers ($\rho \approx 1$)
  (2) No linkage ($q = 0$) and $\sigma \gg \eta^S \Rightarrow$ full shifting ($\rho \approx 1$)

Case (2) is the usual assumptions in the labor supply/elasticity of taxable income literature

Figure 9 – Incidence with tax-benefit linkage

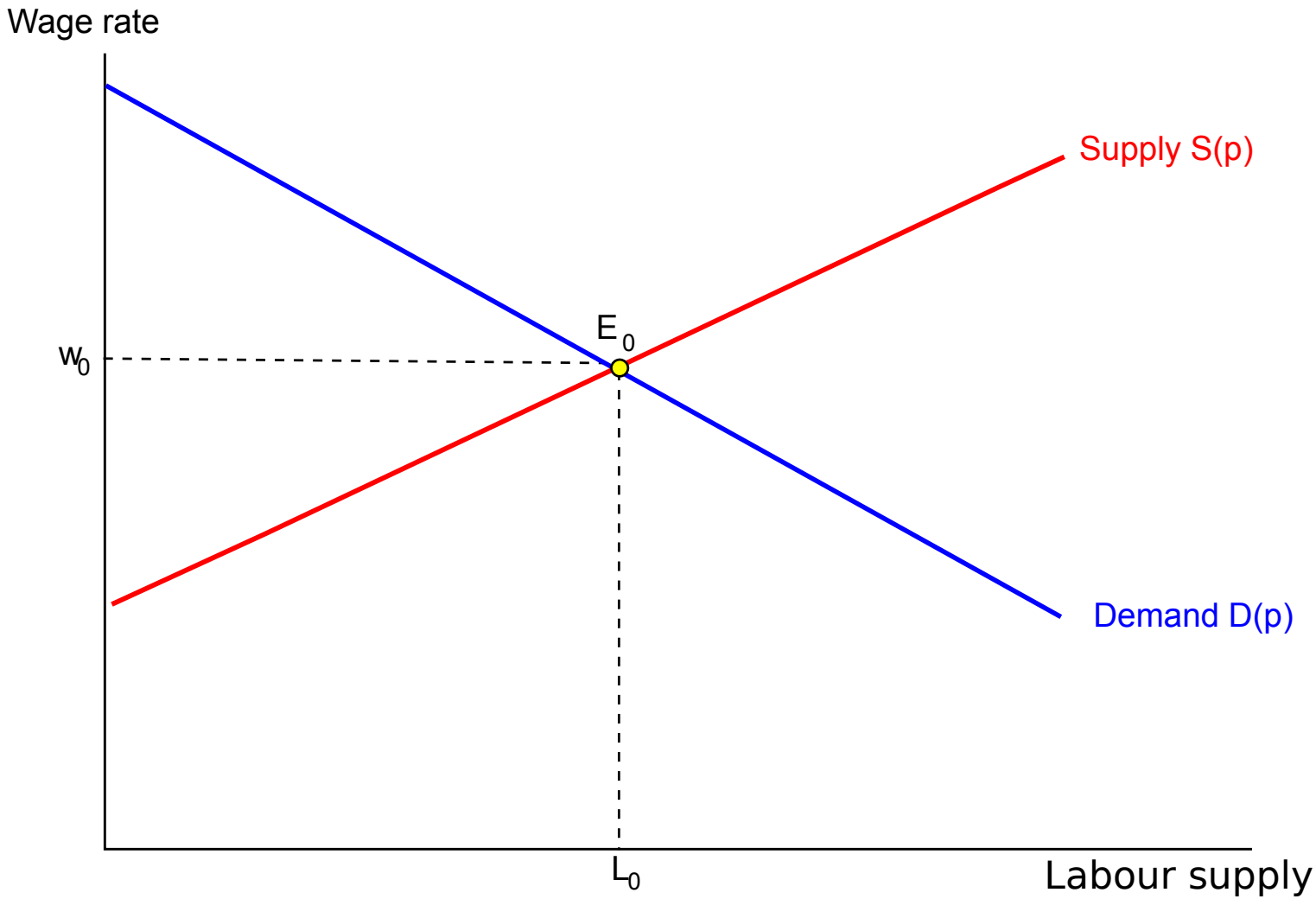


Figure 10 – Incidence with tax-benefit linkage

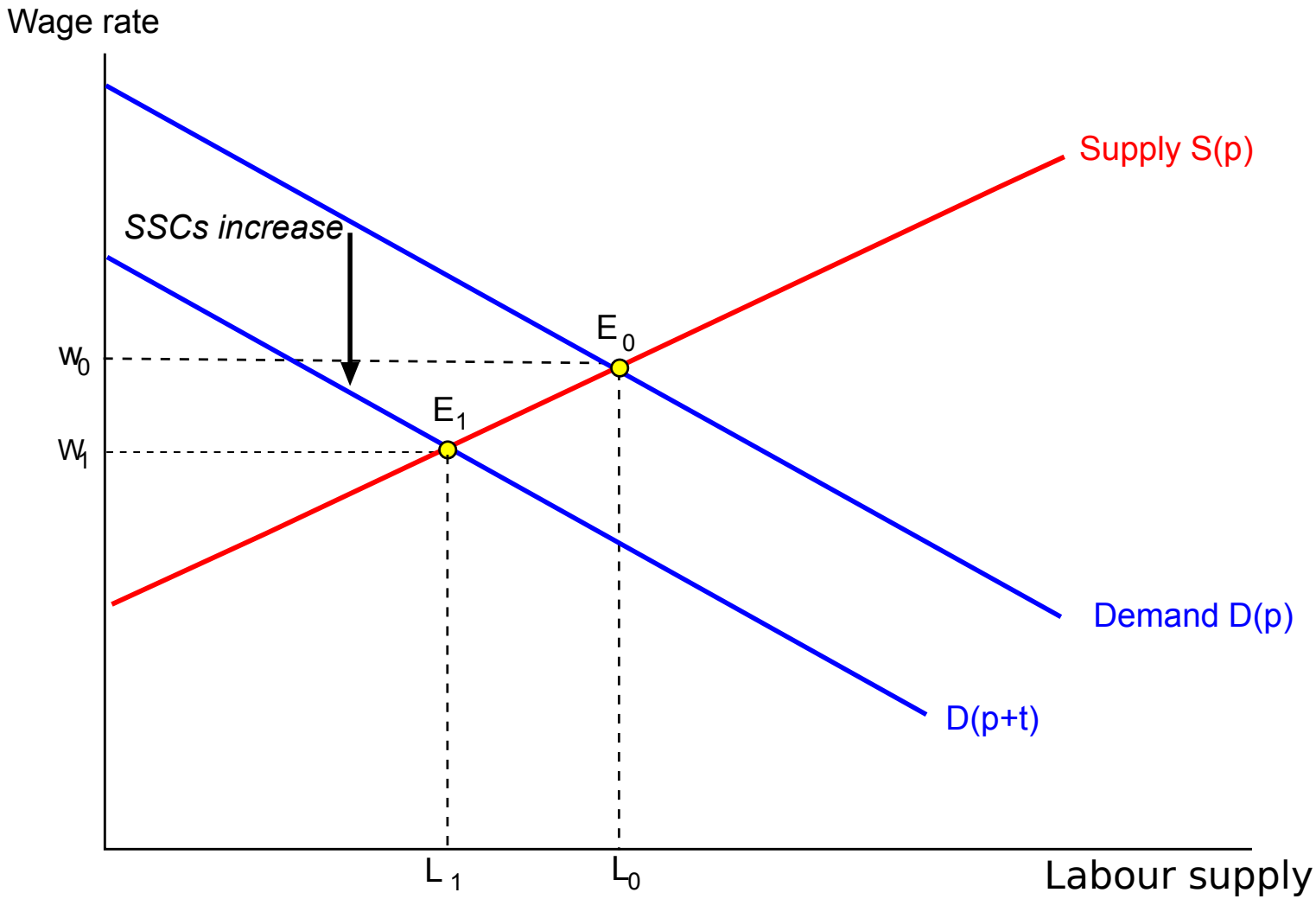
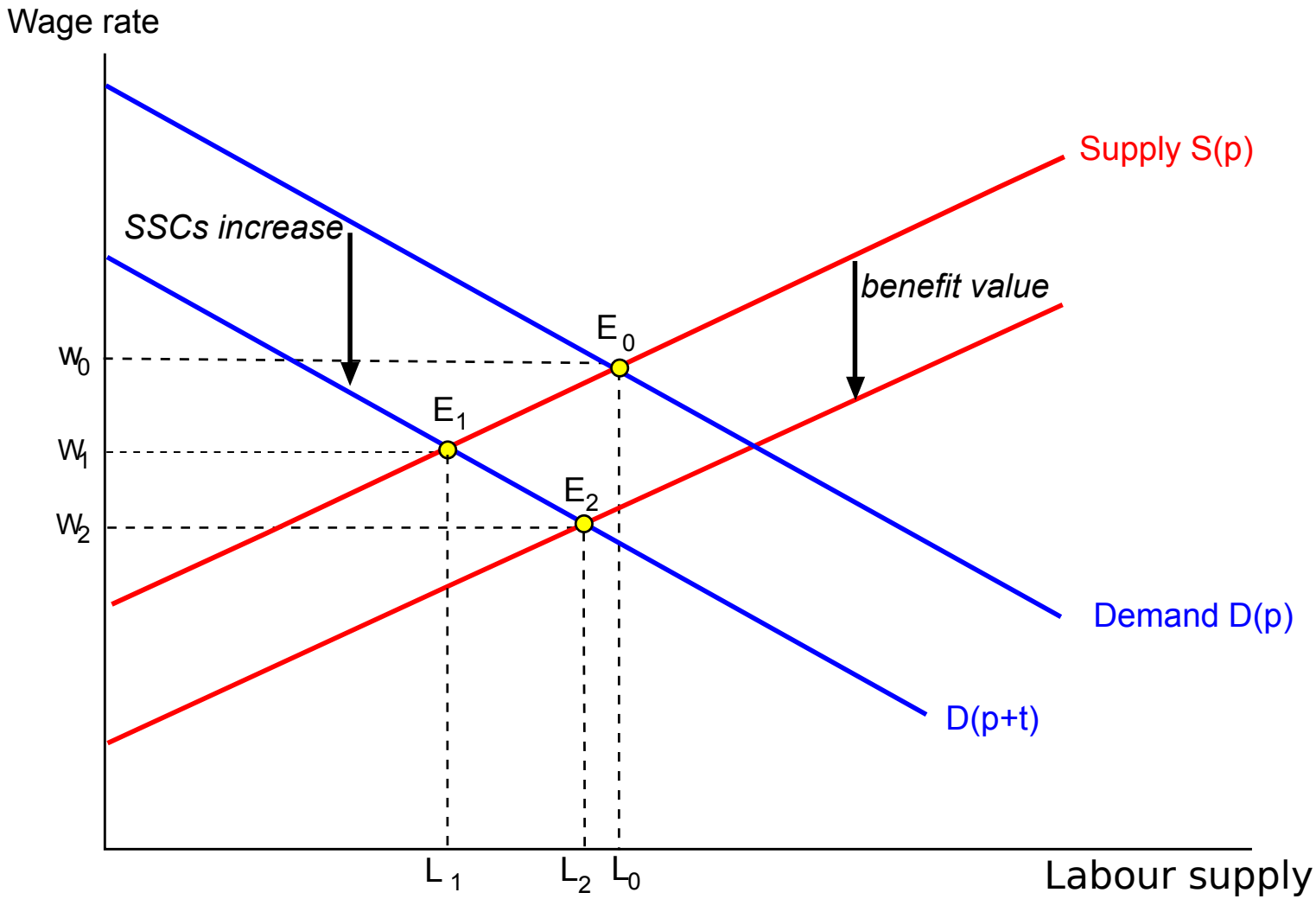


Figure 11 – Incidence with tax-benefit linkage



Empirical estimates : SSC

- **Textbook view**
  - *"knowledge of statutory incidence tells us essentially nothing about who really pays the tax"* (Rosen, 2002)
  - *"payroll taxes are borne fully by workers"* (Gruber, 2007)

- But relatively **little empirical evidence** until recently

Empirical estimates : SSC

- **Macro evidence**
  - Labour income shares fairly stable
  - Cross-country studies (Brittain, 1971 ; OECD, 1990 ; Tyrvainen, 1995 ; Alesina and Perotti, 1997 ; Daveri and Tabellini, 2000 ; Nunziata, 2005 ; Ooghe et al, 2003)
- **Early micro studies**
  - Hamermesh (1979) ; Neubig (1981) ; Holmlund (1983)
- **Quasi-experimental studies**
  - Gruber (1994) : Mandated maternity benefits
  - Anderson and Meyer (1997, 2000) : US UI
  - Bennmarker et al. (2009) ; Korkeamäki (2011) ; Lehmann et al. (2013) : reductions in SSCs

Gruber (JOLE, 1997)

- **The Chilean reform**
  - Chile privatized its public pension system in 1981
  - Large cut in SSCs
  - Expected increase in private pension savings
- **Methodology**
  - Time-series and cross-section estimation
  - Use firm data and firm-level SSC change
- **Results**
  - No employment effect and full-shifting of SSCs to wages (i.e., wage increase of similar magnitude to drop in SSC)

Gruber (JOLE, 1997)

- Difference Specification

$$\Delta log(W_{ijt}/E_{ijt}) = a + b_1 \Delta t_{ijt} + e_{ijt}$$

- Triple DiD (across blue and white collar)

Table 1 – Coefficient on Contributions/Wages in Cross-Sectional Regressions

	Pooled		Blue-collar		White-Collar	
	Wages	Employment	Wages	Employment	Wages	Employment
Basic difference	-1.120	0.008	-0.899	0.190	-1.350	-0.183
	(0.099)	(0.106)	(0.108)	(0.130)	(0.172)	(0.170)
DDD	-1.022	-0.113				
	(0.180)	(0.165)				
N	6,066	6,066	3,298	3,298	2,768	2,768

SOURCE : Gruber (1997), Tab. 3., p. S95.

Saez, Matsaganis and Tsakloglou (QJE, 2012)

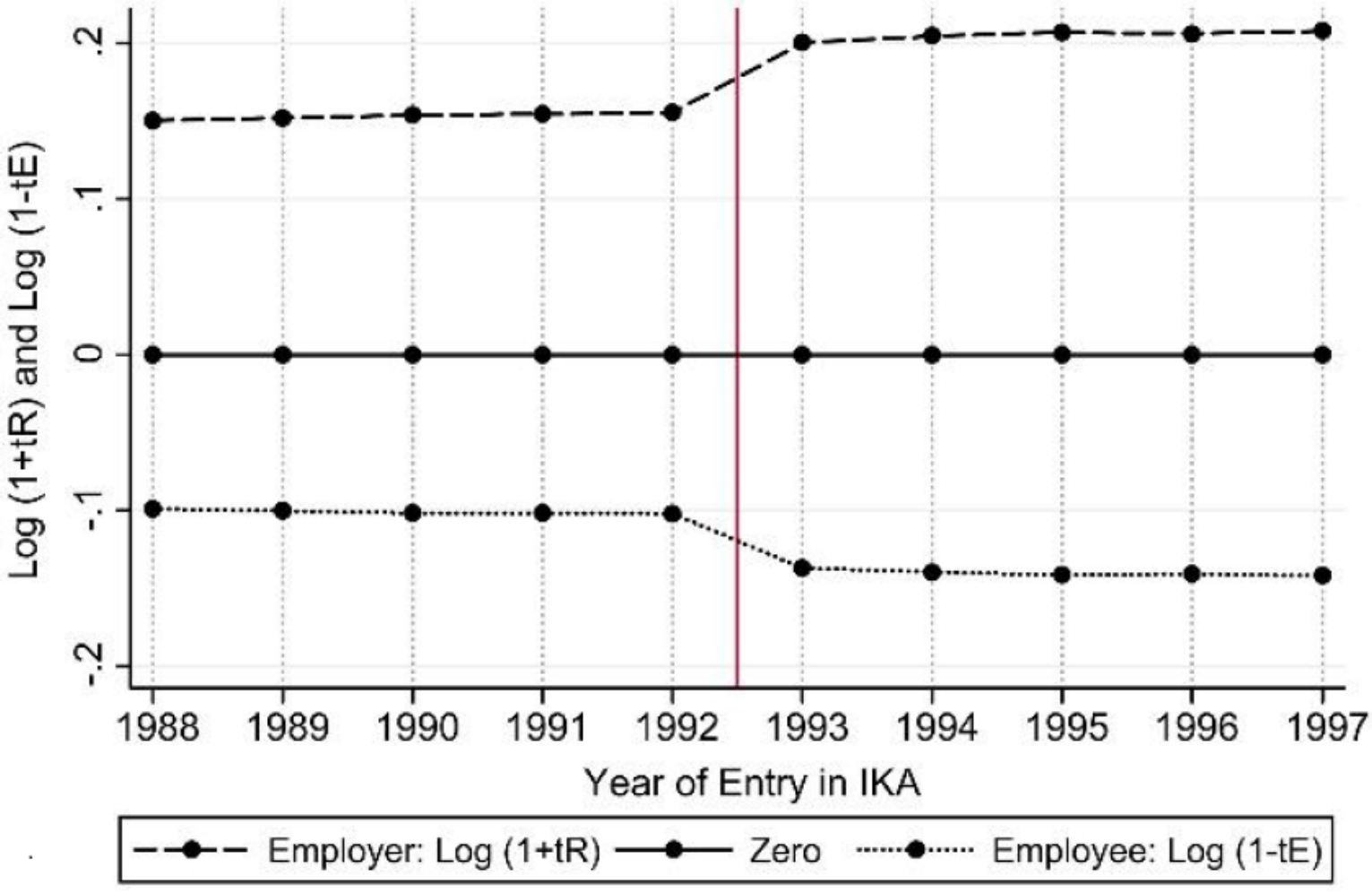
- **The 1992 Greek reform**
  - Greece has high SSC rates (28% employer, 16% employee)
  - SSCs up until a threshold (2432 euros monthly earnings)
  - Increase of threshold to 5,543 euros for new entrants

  $\Rightarrow$ Reform led to different SSC schedules for adjacent cohort

- **Methodology : Regression Discontinuity Design**
  - RDD approach based on date of entry
  - Estimate long-run incidence effects
  - Use administrative data from Greek social insurance

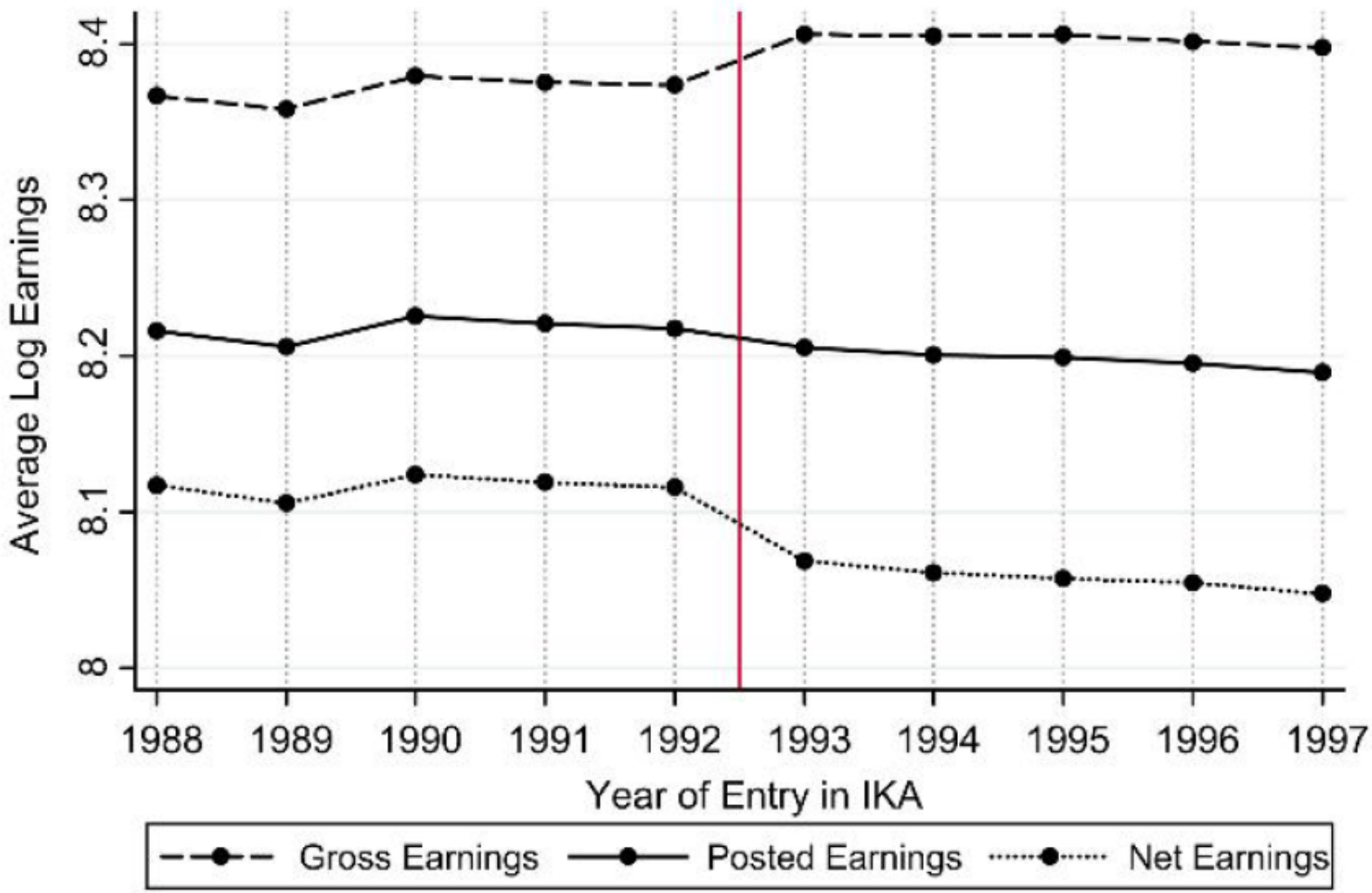
- **Results**
  - No labour supply effect (neither intensive nor extensive)
  - Incidence of SSCs similar to nominal incidence (i.e., employer SSCs fall on employers, employee SSCs fall on employees)

Figure 12 – First stage : Average Tax Rates Above Old Cap



SOURCE : Saez et al. (2012), Fig. V.A, p. 522.

Figure 13 – Tax Incidence : Average Earnings Above Old Cap



SOURCE : Saez et al. (2012), Fig. V.B, p. 522.

Table 2 – Tax Incidence Effects : RDD estimates

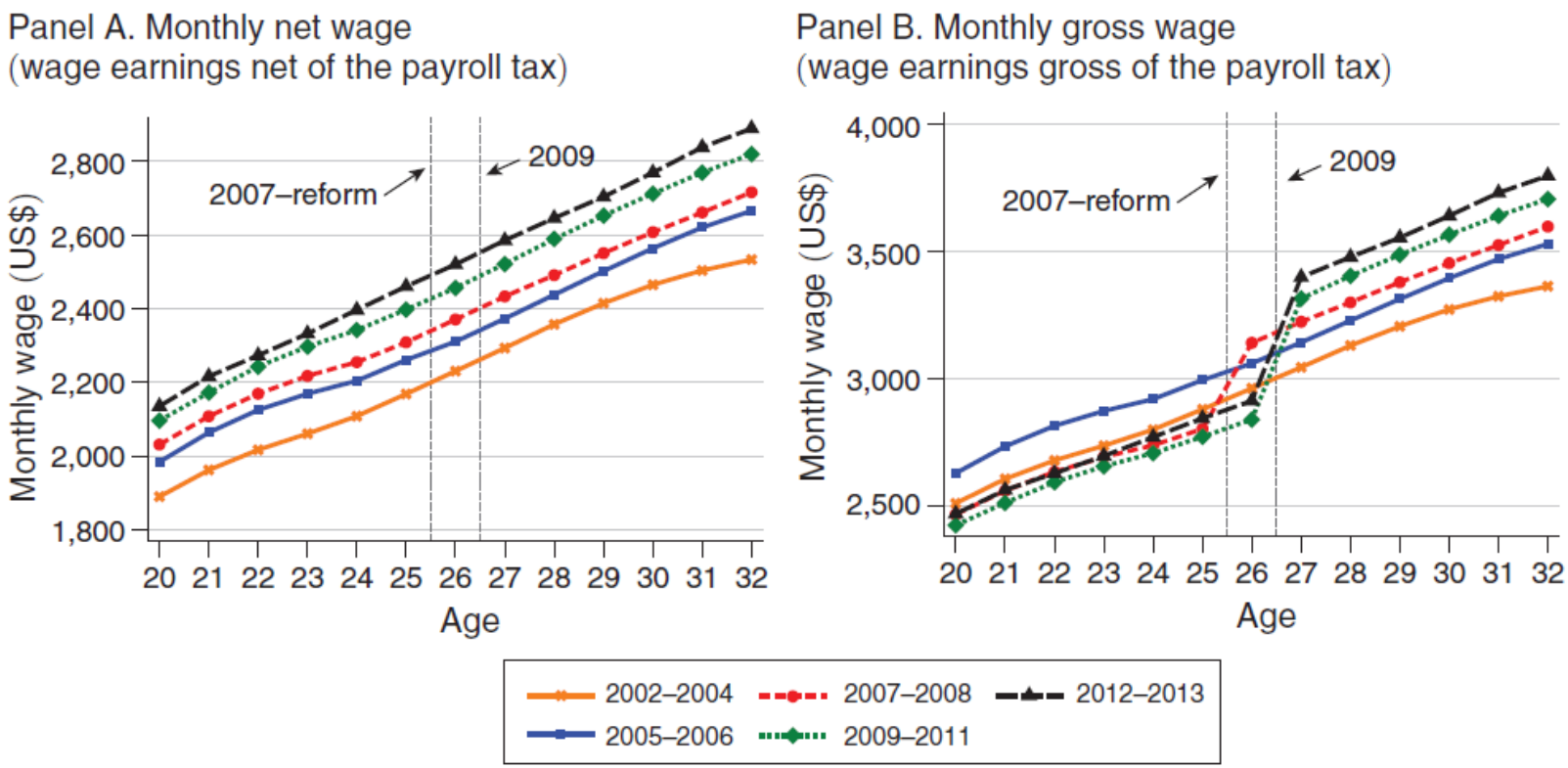
Sample :	1988–1997 entrants	1991–1994 entrants only	1988–1997 entrants	1988–1997 entrants	1988–1997 entrants
	(1)	(2)	(3)	(4)	(5)
Panel B. Gross, posted, and net earnings (above old cap)					
Log gross earnings z	0.031	0.033	0.029	0.021	0.040
	(0.007)	(0.012)	(0.007)	(0.011)	(0.016)
Log posted earnings w	-0.013	-0.009	-0.015	-0.021	0.001
	(0.008)	(0.013)	(0.008)	(0.012)	(0.017)
Log net earnings c	-0.047	-0.043	-0.050	-0.055	-0.031
	(0.009)	(0.014)	(0.009)	(0.013)	(0.018)
Number of observations	50,084	18,846	50,084	50,084	50,084
Controls					
Linear entry date trends	Yes	Yes	Yes	Yes	Yes
Monthly dummies			Yes	Yes	Yes
Quadraticdate trends				Yes	Yes
Cubic entry date trends					Yes

SOURCE : Saez et al. (2012), Tab. V, p. 523.

Saez, Schoefer and Seim (AER, 2019) – Sweden

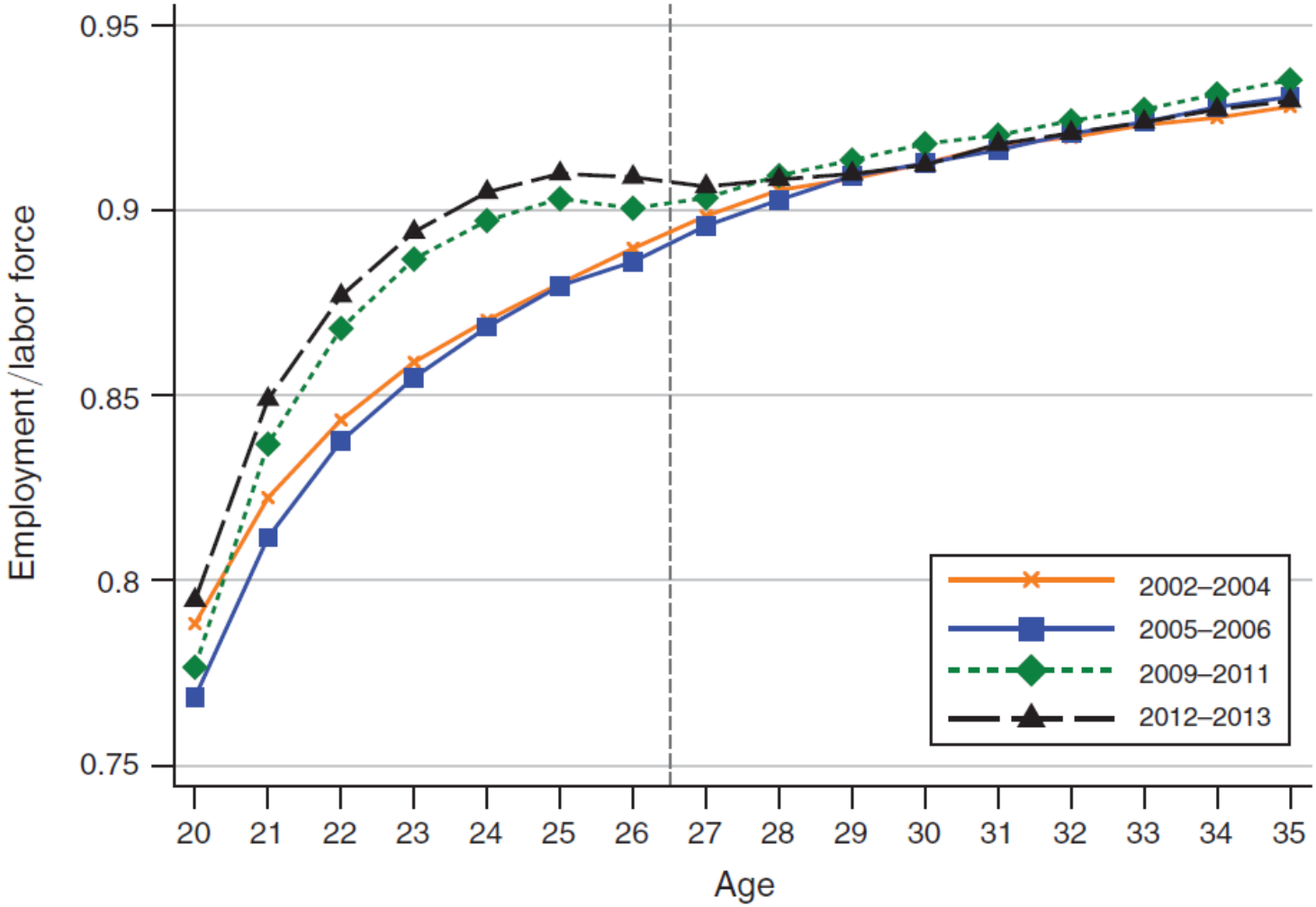
- **The Swedish reform**
  - 2007 cut to payroll tax rate (from 31.4% to 21.3%) for workers aged 19–25
  - 2009 cut to 15.5% for workers aged 19–26
  - Reform repealed in 2015-16
- **Methodology (1) : worker-level**
  - RDD approach based on age
  - Estimate long-run incidence effects + employment
  - Use administrative data from Swedish social insurance
- **Results**
  - No shifting at individual level to wages (100% pass-through to firms)
  - Large impact on employment

Figure 14 – The effect of the payroll tax cut on wages



SOURCE : Saez, Schoefer and Seim (2019), Fig. 2, p. 1727.

Figure 15 – Employment impact

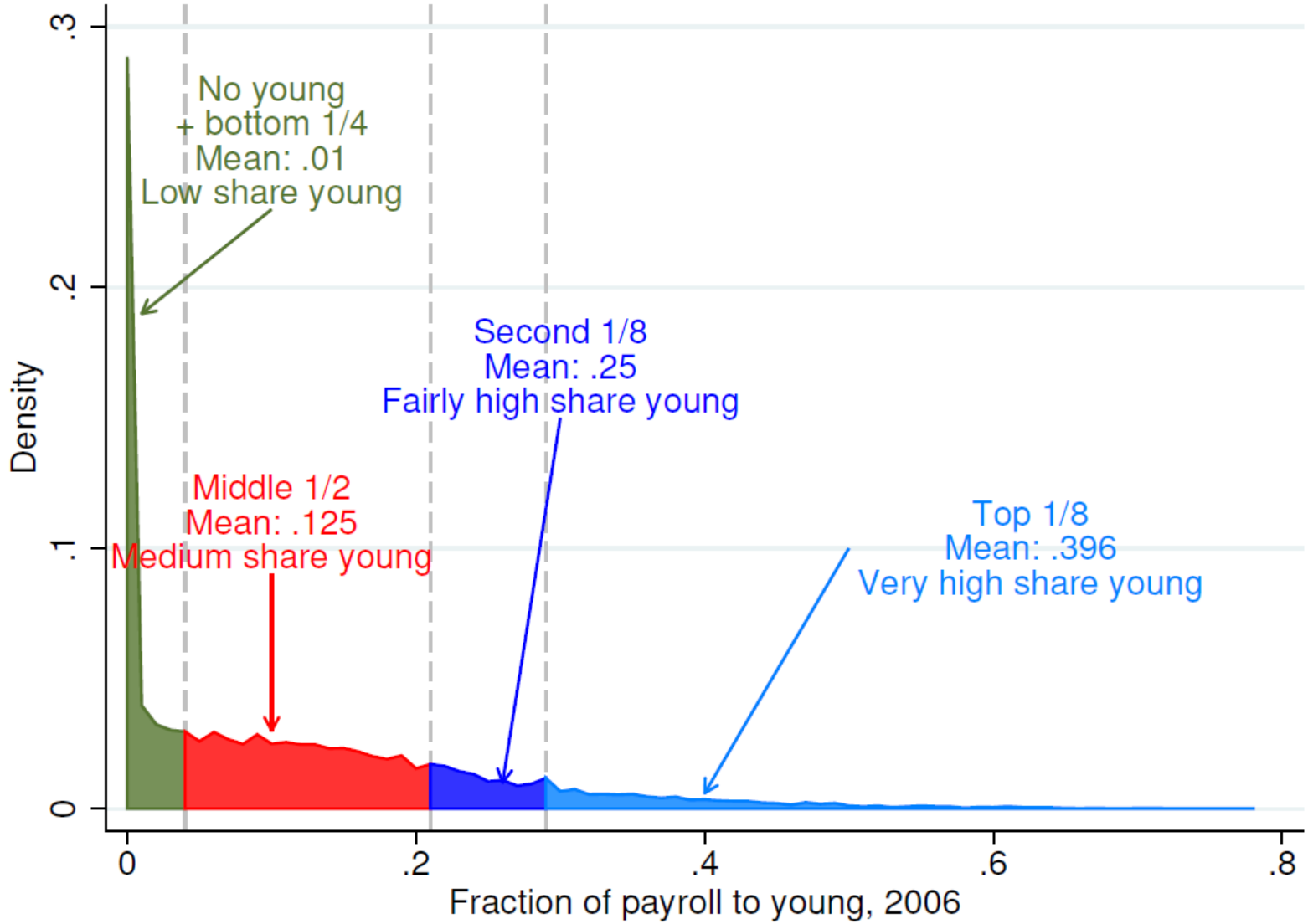


Source : Saez et al. (2019).

Saez et al. (AER, 2019) – Sweden

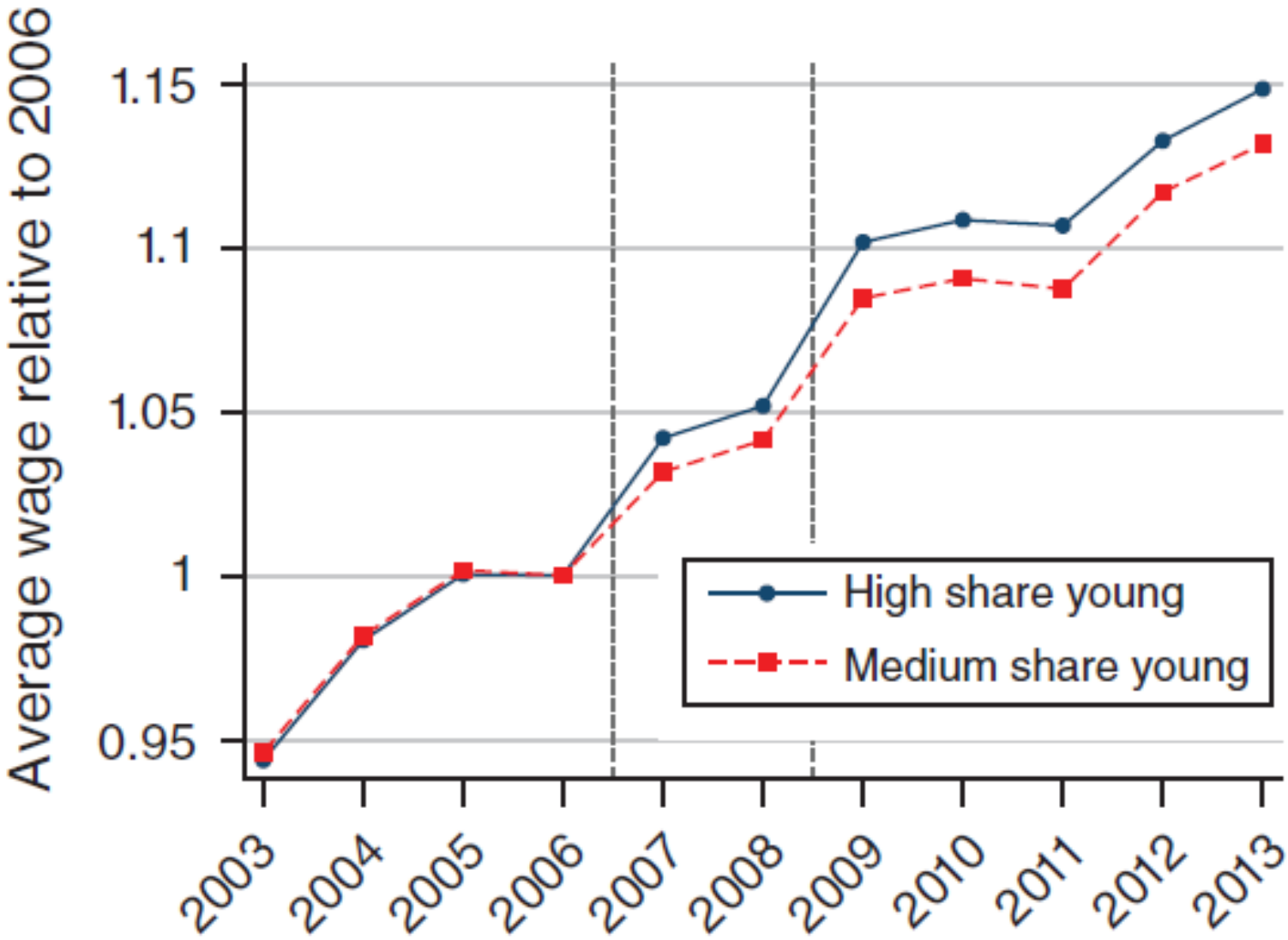
- **Methodology (2) : firm-level**
  - DiD between firms with high share of young vs low share
  - Estimate impact on scale (employment, valued-added, profit, etc.)
  - Estimate firm-level incidence (impact on total wage)
  - Merge employee data with firm-level accounting data
- **Results**
  - Large impact on activity (+value-added, +employment, + profit)
  - Large impact on wage of all workers
  - Incidence : fully shifted to workers at firm-level

Figure 16 – Heterogeneity in exposure



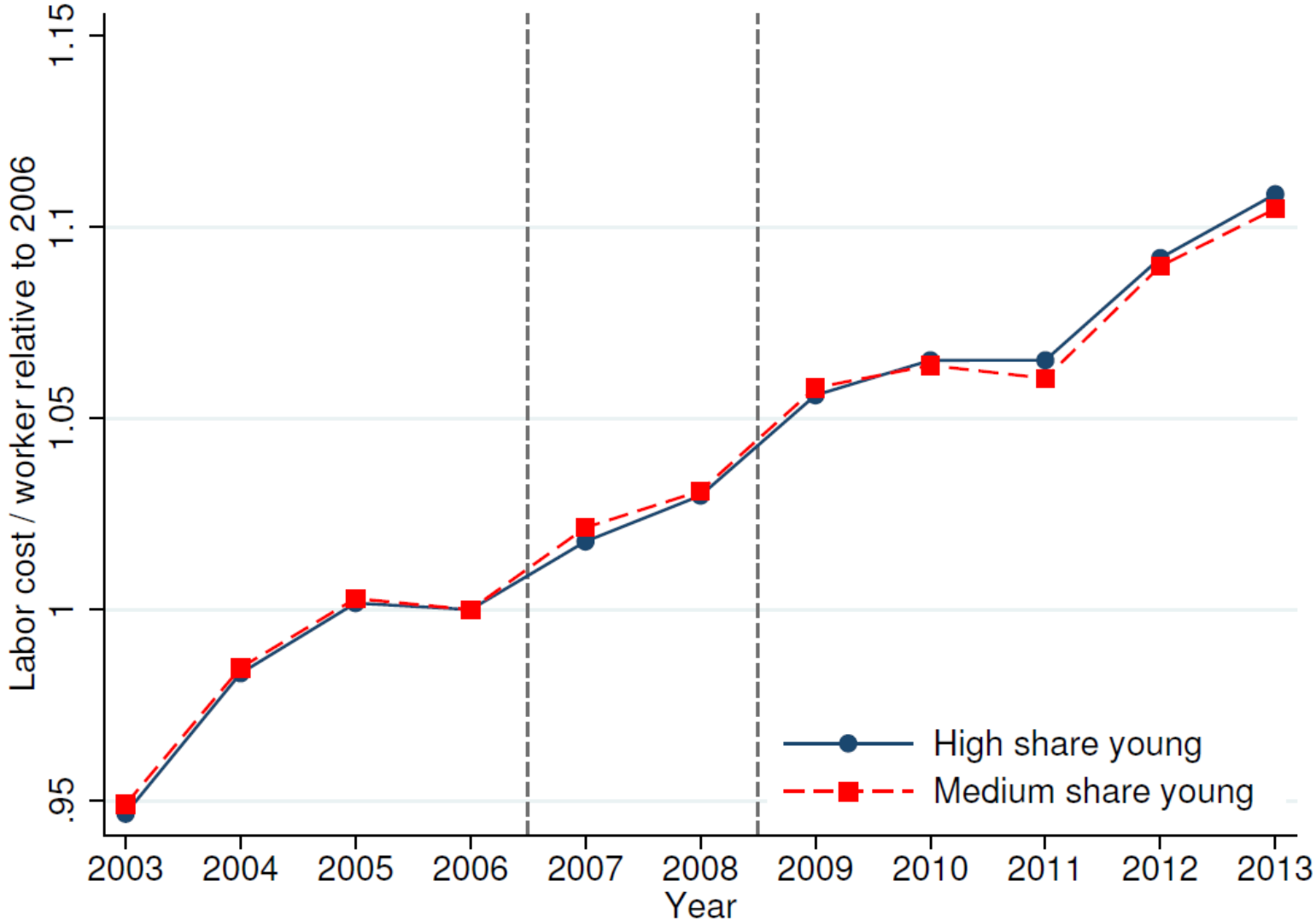
Source : Saez et al. (2019).

Figure 17 – Net wage on firms with high share of young



Source : Saez et al. (2019).

Figure 18 – Average labour cost per worker : high vs medium share of young

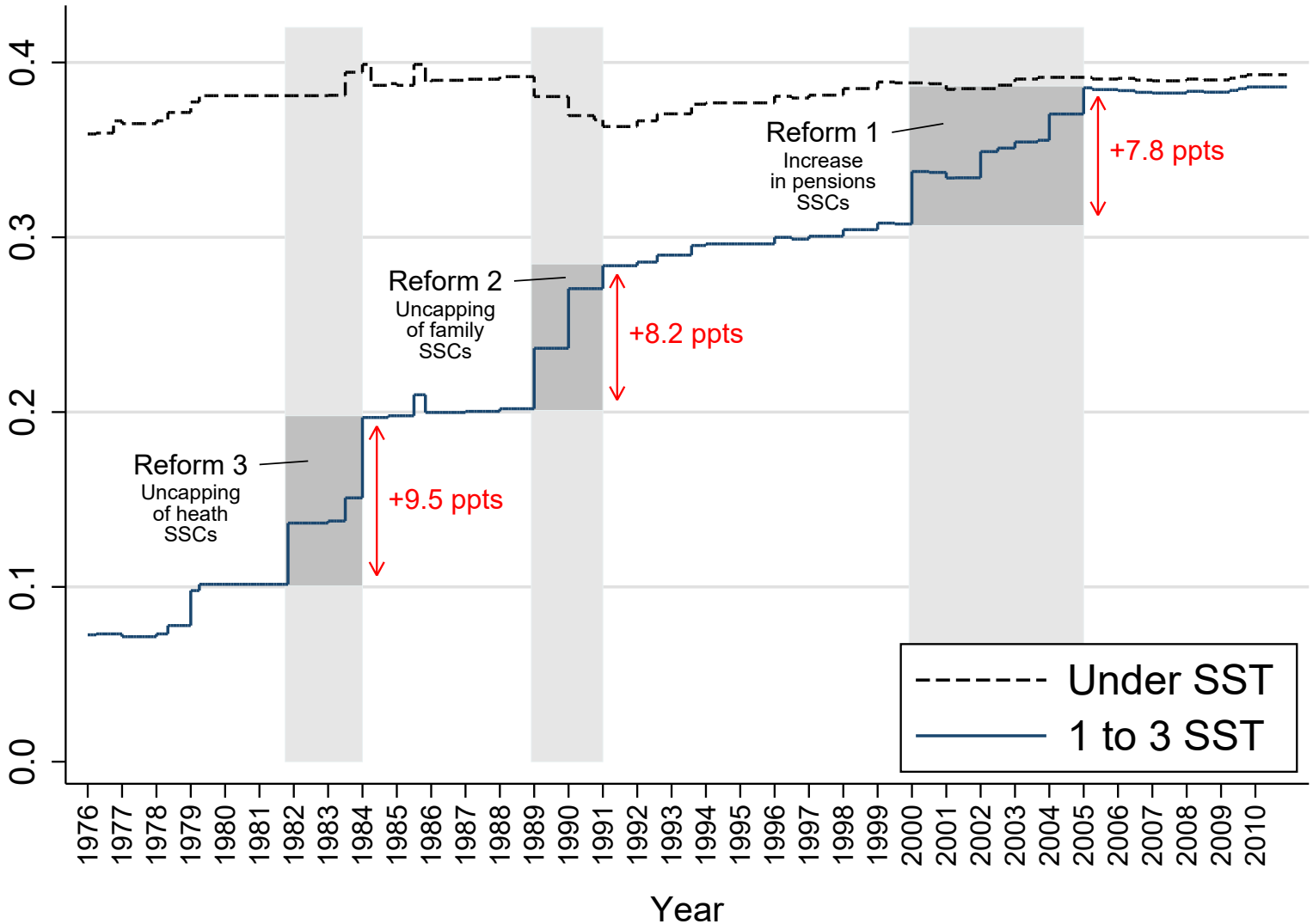


Source : Saez et al. (2019).

Bozio, Breda, Grenet and Guillouzouic (2019) – France

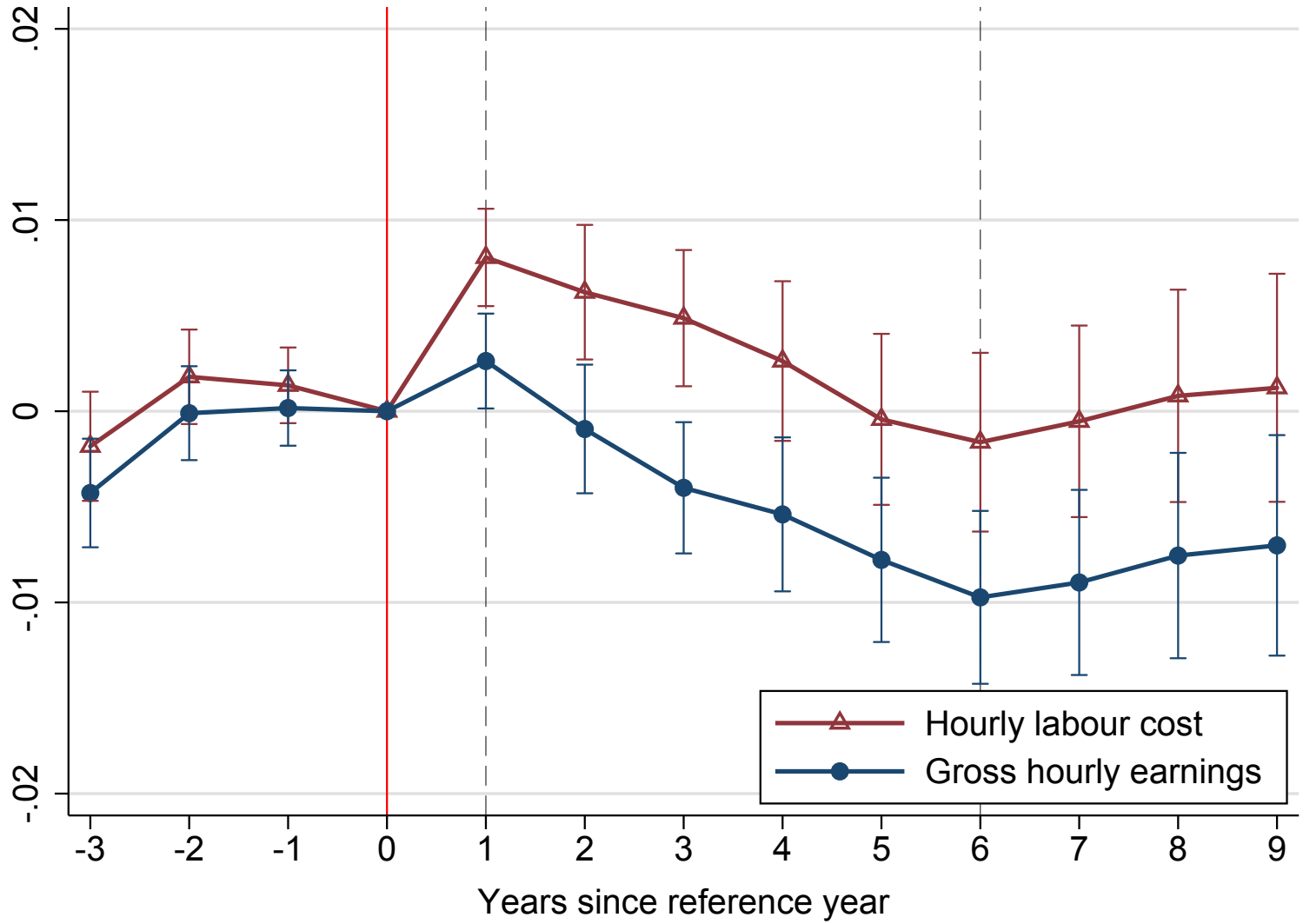
- **French SSC reforms**
  - Exploit three uncapping reforms in France
  - Different tax-benefit linkage
- **Methodology**
  - DD approach based on pre-reform earnings w.r.t threshold
  - Estimate long-run incidence effects
  - Use administrative data (DADS data)
- **Results**
  - Incidence of SSCs on employers for reforms with no tax-benefit linkage
  - Incidence of SSCs on employees in reform with strong tax-benefit linkage

Figure 19 – Marginal Employer SSC Rates, Non-Executives, 1976–2010



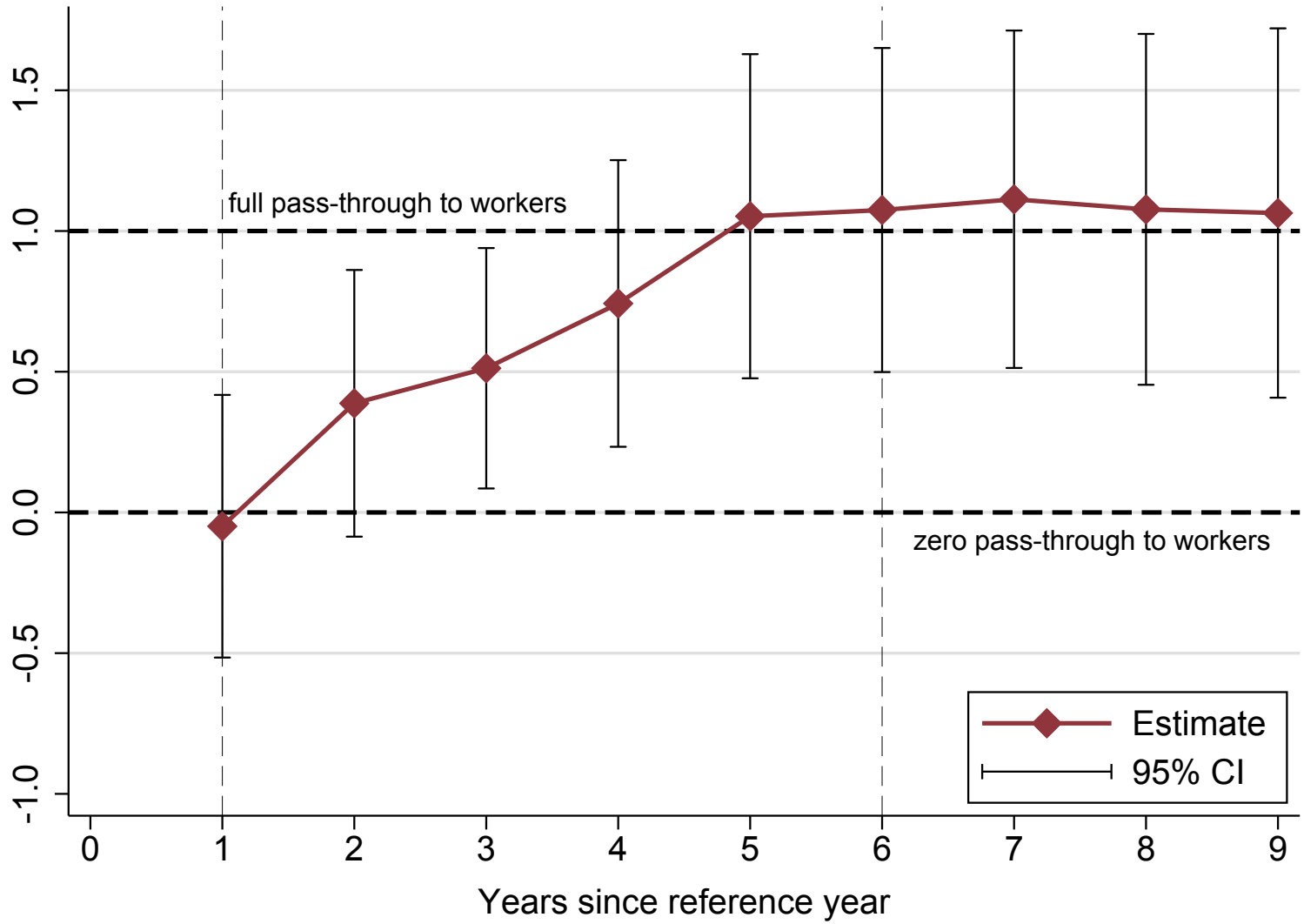
Sources : *IPP Tax and Benefit Tables* (April 2016 ; TAXIPP 0.4)

Figure 20 – Reform 1 : log(z) vs log(w)



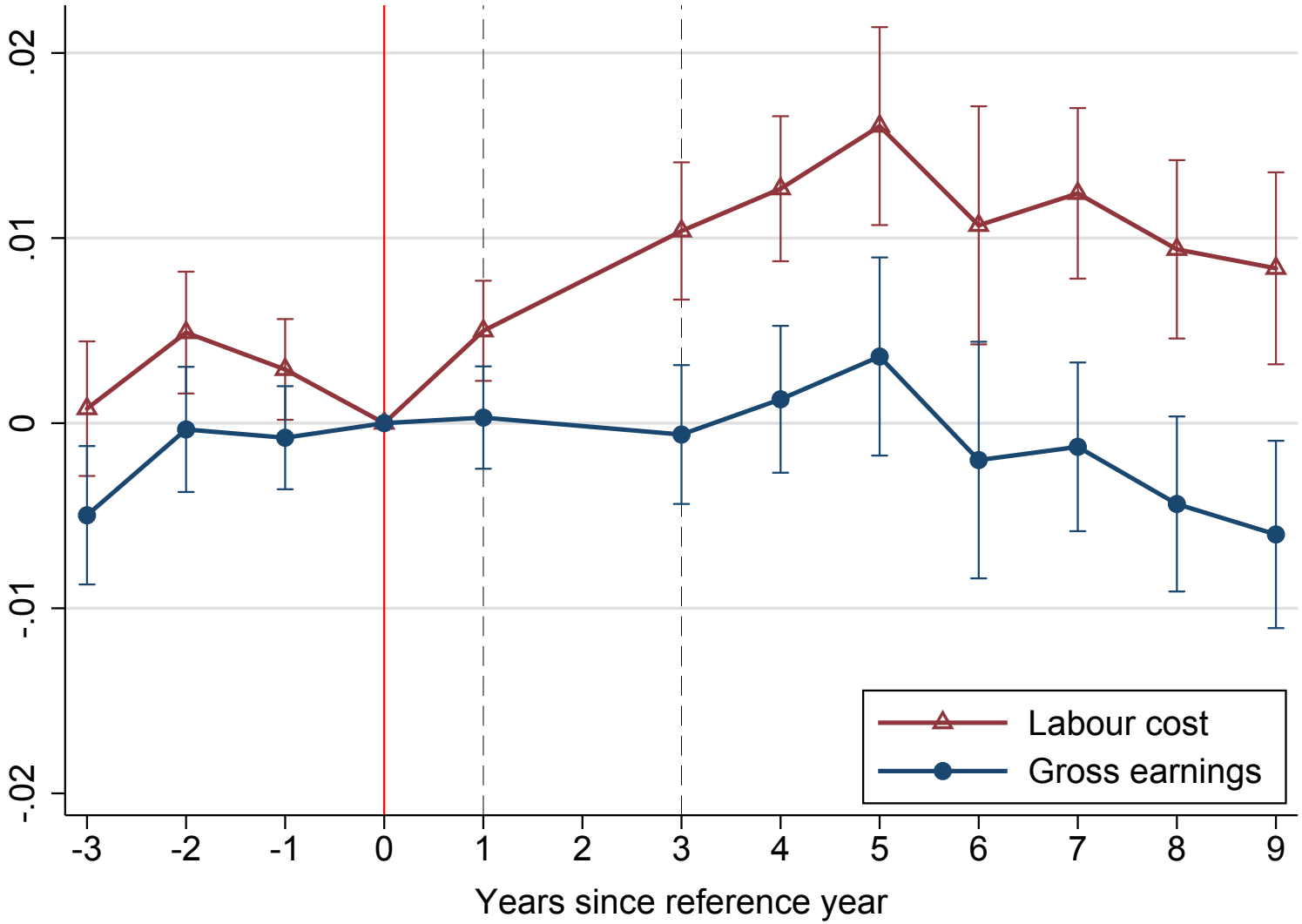
Source : Bozio et al. (2019).

Figure 21 – Reform 1 : Pass-Through Rate on Workers – w – with trends



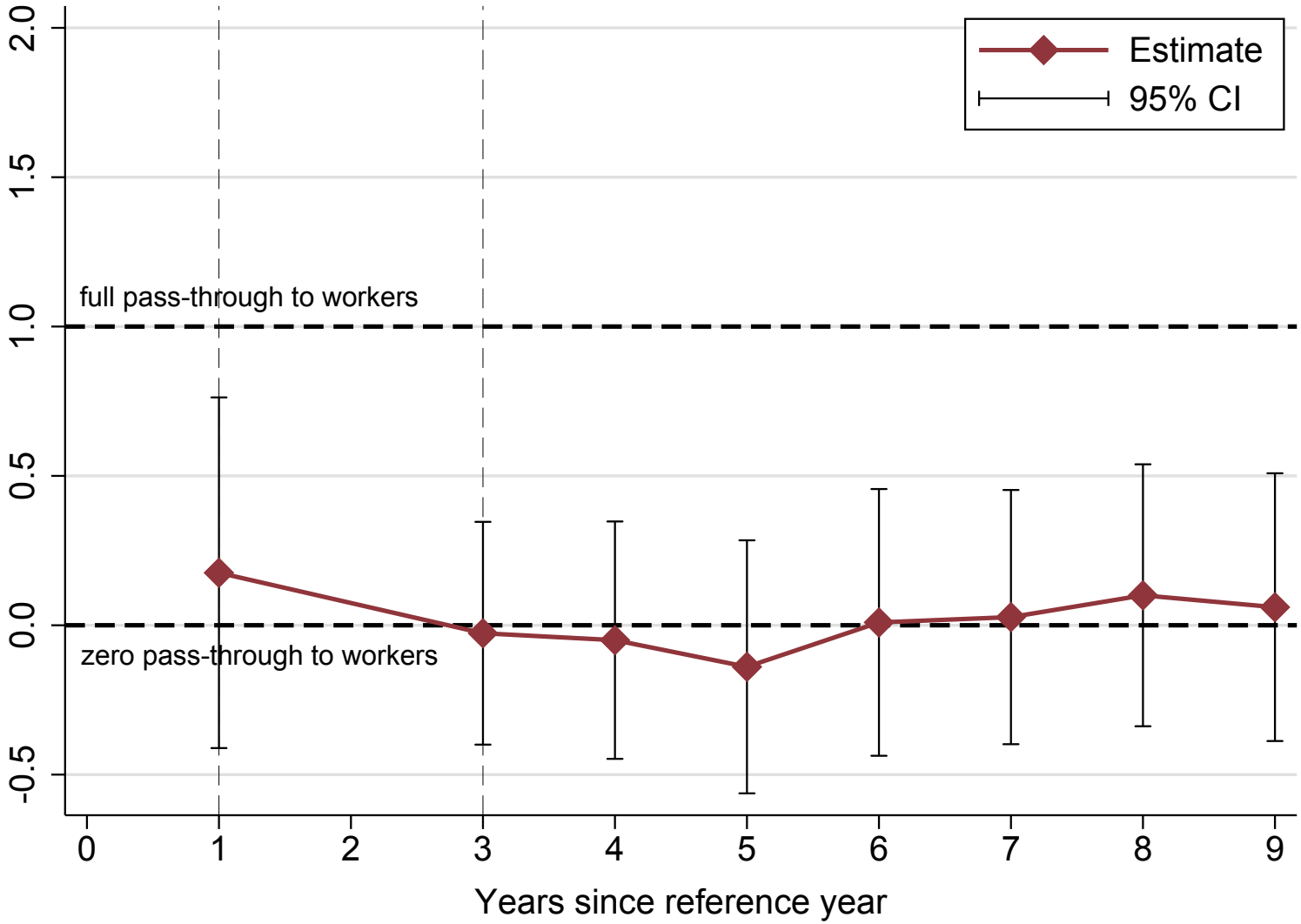
Source : Bozio et al. (2018).

Figure 22 – Reform 2 : log(zh) vs log(wh)



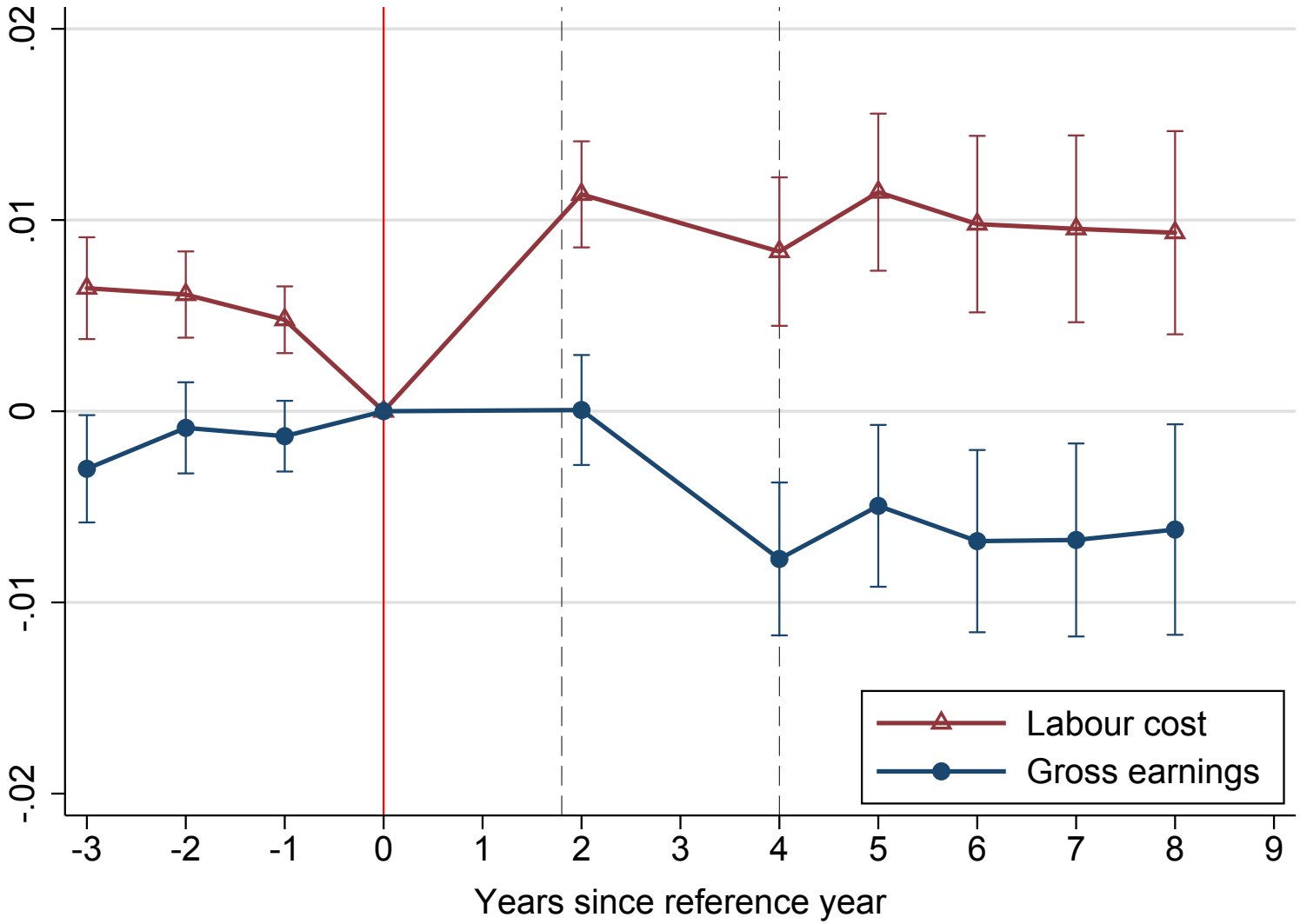
Source : Bozio et al. (2019).

Figure 23 – Reform 2 : Pass-Through Rate on Workers– with trends



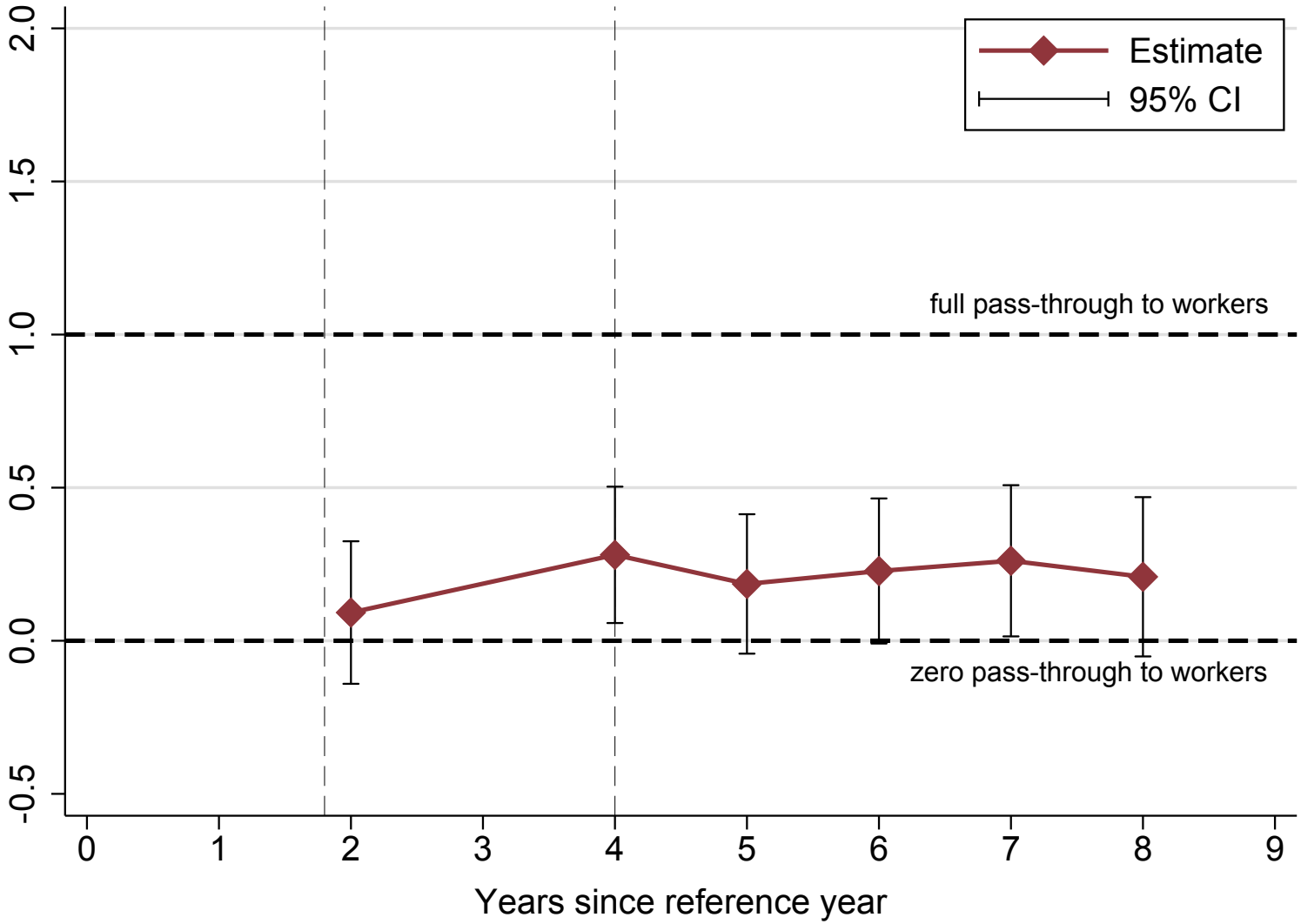
Source : Bozio et al. (2019).

Figure 24 – Reform 3 : log(zh) vs log(wh)



Source : Bozio et al. (2019).

Figure 25 – Reform 3 : Pass-Through Rate on Workers – with trends



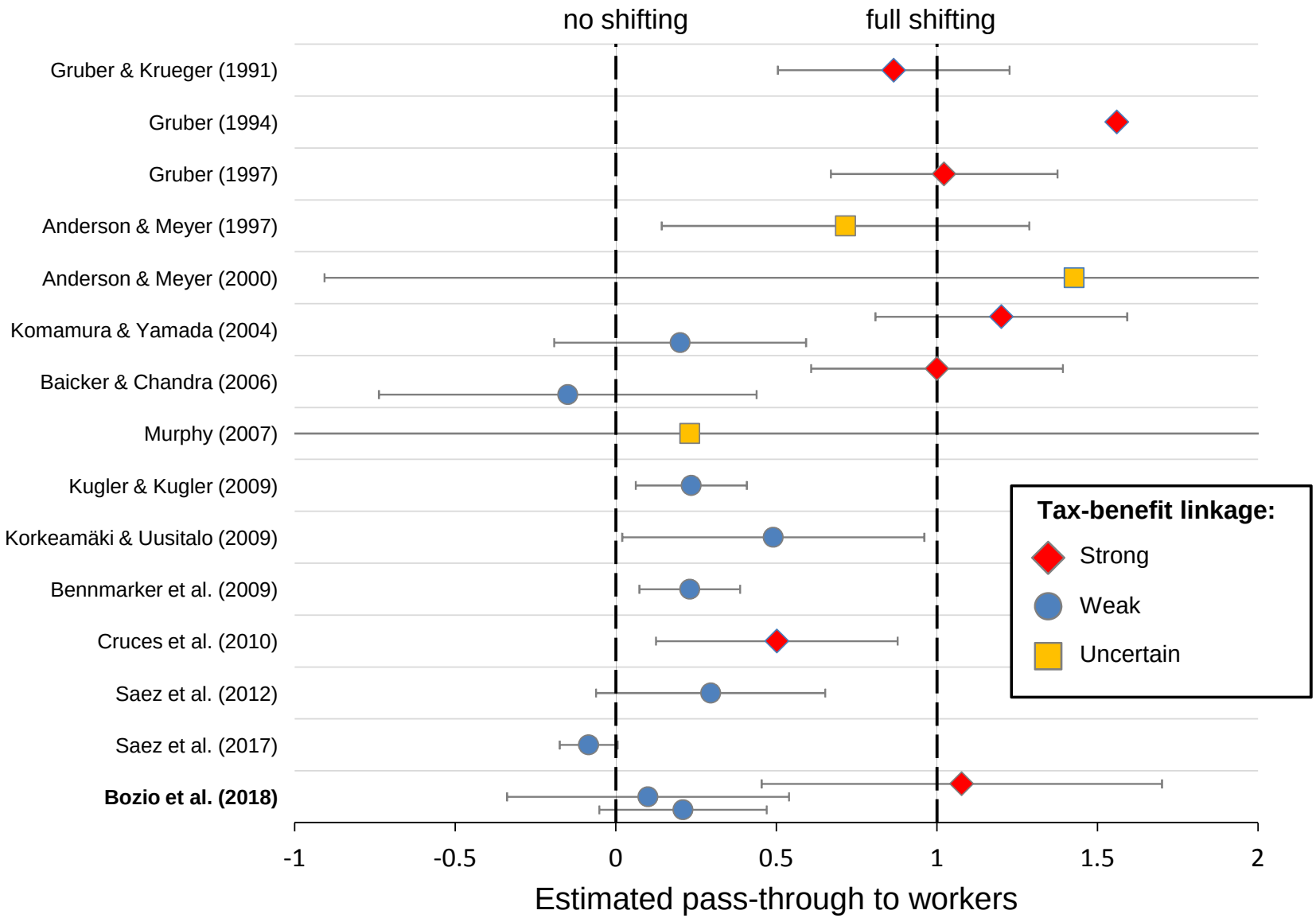
Source : Bozio et al. (2019).

Bozio et al. (2019) : Summary

Table 3 – Baseline estimates of pass-through rate on workers

Reform :	**Reform 1**		**Reform 2**	**Reform 3**
Dep. var. :	log(hourly wage)	log(earnings)	log(earnings)	log(earnings)
	Panel A. Without controlling for individual-specific trends			
t_0+8	0.934***	0.812***	0.186	0.384**
	(0.303)	(0.293)	(0.166)	(0.172)
t_0+9	0.906***	0.969***	0.215	n/a
	(0.327)	(0.324)	(0.170)	n/a
	Panel B. Controlling for individual-specific trends			
t_0+8	1.077***	1.112***	0.100	0.209
	(0.318)	(0.291)	(0.224)	(0.133)
t_0+9	1.064***	1.157***	0.061	n/a
	(0.335)	(0.308)	(0.229)	n/a

Figure 26 – Meta-Analysis of Payroll Tax Incidence



Empirical estimates : income tax

- **Limited evidence**
  - General assumption that income tax falls on individuals
  - In theory, income tax could be incident on employers

    e.g., contract of footballers expressed 'net of tax'

- **Evidence**
  - Kubik (JPubE, 2004) : TRA in the U.S. in 1986, drop in tax rates lead to lower pre-tax wage
  - Lehman, Marical and Rioux (JPubE, 2013) : in France incidence of SSCs reduction vs income tax
  - Bingley and Lanot (JPubE, 2002) : Denmark, partial shifting of income tax

Empirical estimates : benefits

- **Limited evidence**
  - General assumption that benefits benefit individuals
  - In theory, benefits could be incident on employers

    e.g., those on benefits could be paid less

- **Evidence**
  - Rothstein (AEJ-policy, 2010) : EITC in the U.S.
  - Fack (Labour Econ., 2006) : housing benefits in France
  - Azmat (Quant. Econ., 2019) : WFTC in the U.K.
  - Garriga and Tortarolo (2020) : tax credit in Argentina

II. Labour supply responses

- **Why labour supply matters**
  - If people work less, as response to tax, then limits to taxation and redistribution
  - Tax increases will impact the tax base, and raise less revenues than expected

- **Labour supply elasticity**
  - Measures how much labour is reduced when net wage is reduced

$$\varepsilon = \frac{\partial logL}{\partial logw}$$

  - Severe challenges to measure ε

II. Labour supply responses

1. Baseline labour supply model
2. Early empirical studies
3. Randomised controlled trials
4. Quasi-experimental evidence
5. Micro vs macro estimates

Baseline model

- **Key assumptions**
  a. Static
  b. Pure intensive margin choice
  c. No frictions or adjustment costs
  d. Linear tax system

- **Optimization problem**
  - Trade-off between consumption (c) and leisure (l)
  - The individual maximizes a utility function $u(c, l)$
  - Individuals earns net of tax wage $w(1 - \tau)$ and has R non-labour income

$$\max_{c,l} u(c, l) \quad \textit{subject to} \quad c = wl + R$$

Baseline model

- **Uncompensated or Marshallian elasticity of labour supply**
  - FOC : $wu_c + u_l = 0$ defines Marshallian labour supply function $l^u(w, I)$
  - Uncompensated elasticity of labour supply : ε^u

$$\varepsilon^u = \frac{w}{l}\frac{\partial l^u}{\partial w}$$

  - % change in hours when net wage increase by 1%

- **Income effects**
  - Income effect parameter η

$$\eta = w\frac{\partial l}{\partial R}$$

  - Increase in non-labour income leads to decrease in labour supply

Baseline model

- **Compensated or Hicksian elasticity of labour supply**
  - Minimization of cost $wl - c$ subject to the constraint of $u(c, l) >= u$ leads to Hicksian labour supply function
  - Compensated elasticity of labour supply : ε^c

$$\varepsilon^c = \frac{w}{l}\frac{\partial l^c}{\partial w}$$

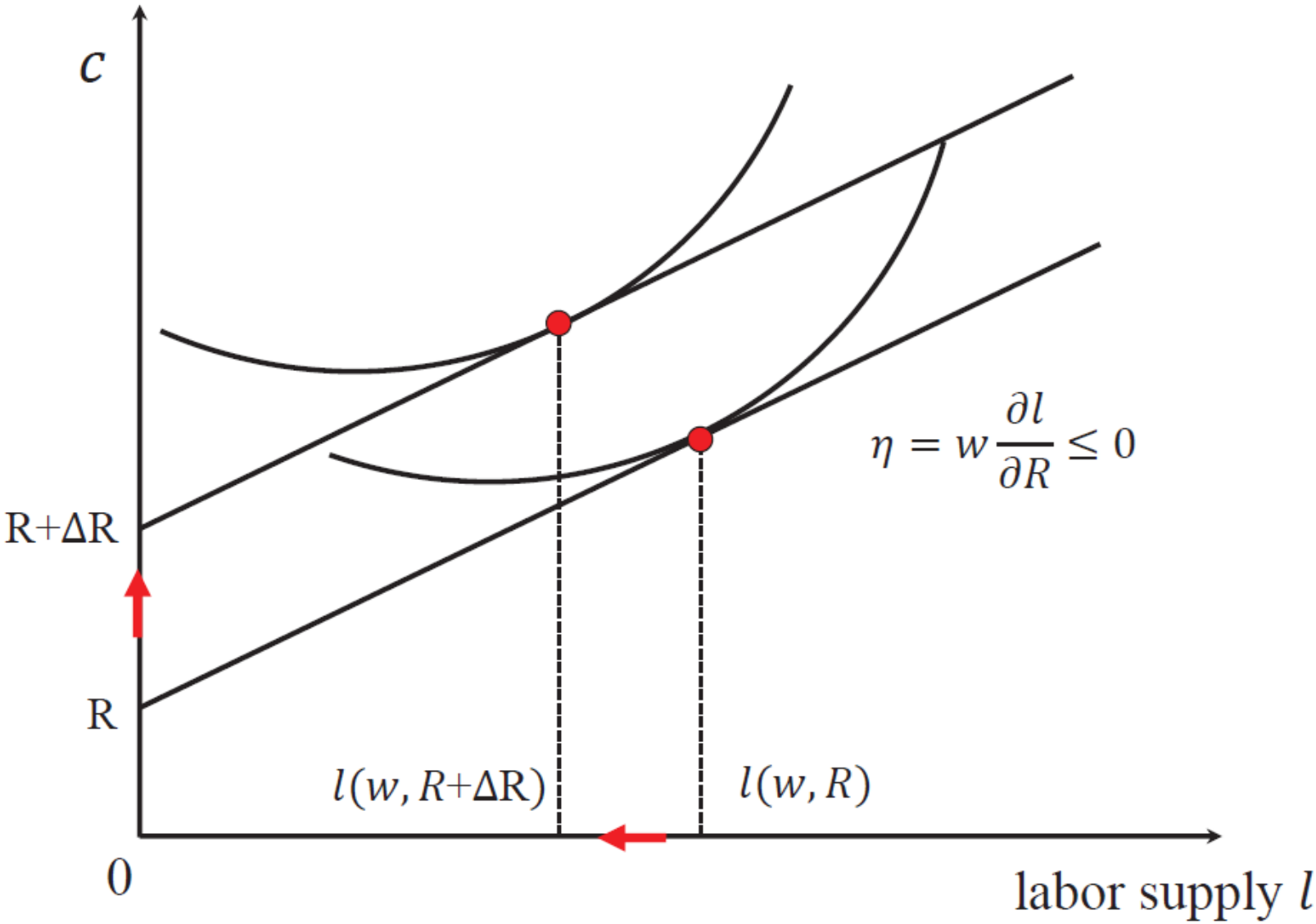
  - Deadweightloss depends on ε^c

- **Slutsky equation**

$$\frac{\partial l}{\partial w} = \frac{\partial l^c}{\partial w} + l\frac{\partial l}{\partial R}$$

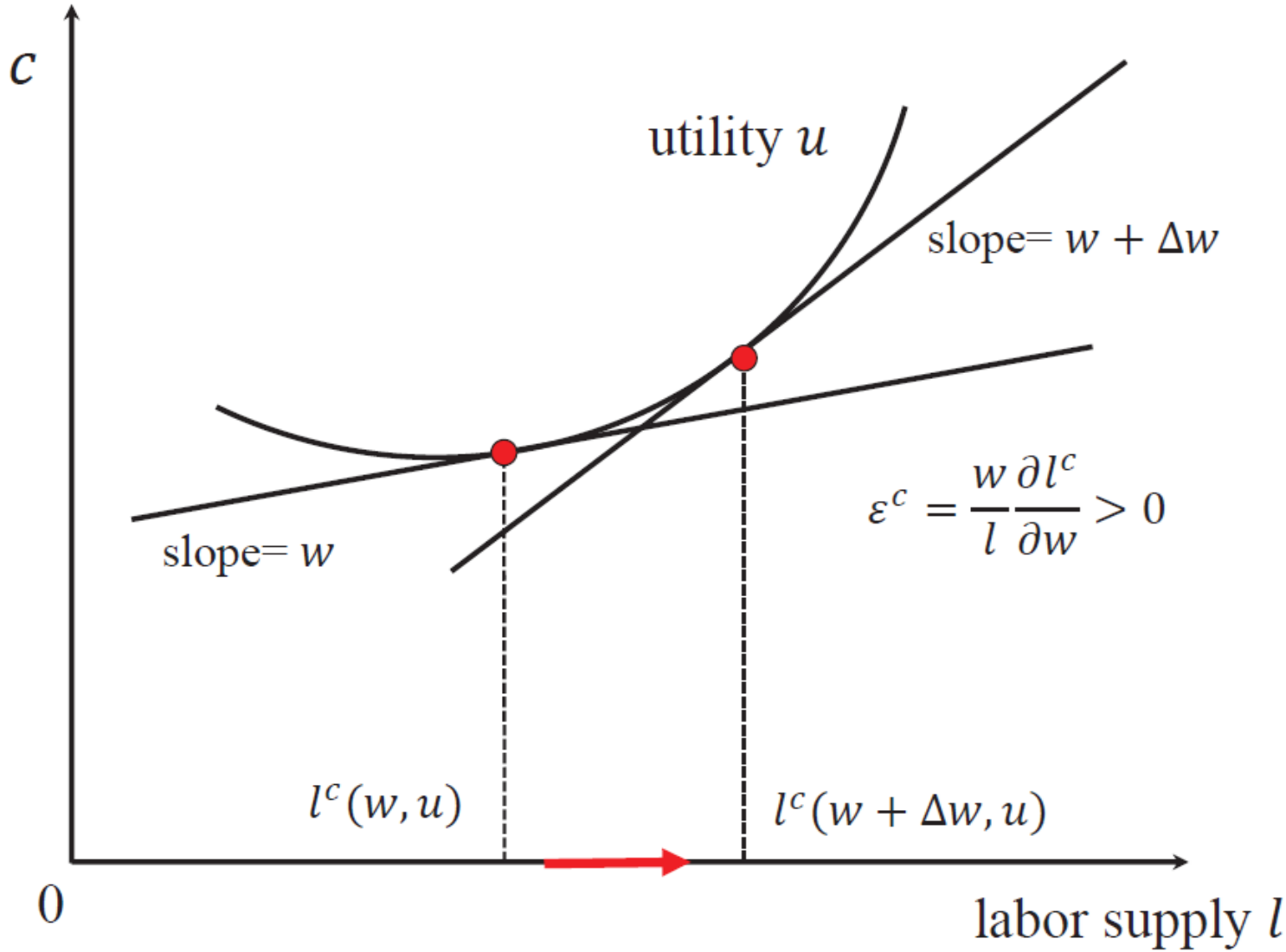
$$\varepsilon^u = \varepsilon^c + \eta$$

Figure 27 – Baseline labour supply model : income effect



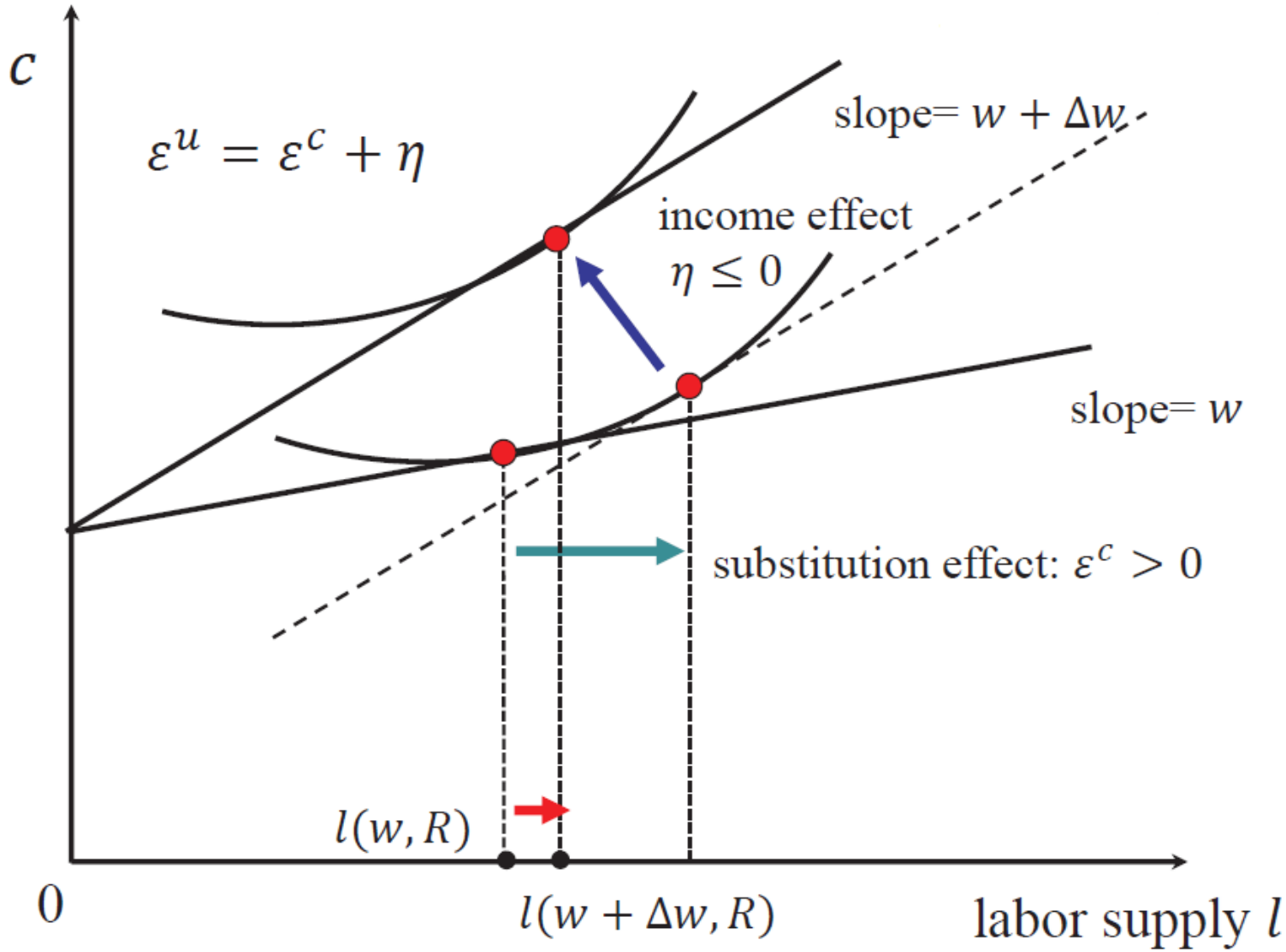
Source : Emmanuel Saez, Graduate Public Economics, slides "labour supply".

Figure 28 – Baseline labour supply model : substitution effect



Source : Emmanuel Saez, Graduate Public Economics, slides "labour supply".

Figure 29 – Baseline model : uncompensated labour supply



Source : Emmanuel Saez, Graduate Public Economics, slides "labour supply".

Baseline model

An increase in income tax has three effects :

1. Income effect : lower unearned income
   $\Rightarrow$ Increases labour supply
2. Income effect : lower after-tax wage
   $\Rightarrow$ Increases labour supply
3. Substitution effect : lower after-tax wage
   $\Rightarrow$ Decreases labour supply

$\Rightarrow$ The net effect is theoretically ambiguous ; it is an empirical question.

Surveys on the labour supply elasticity

- **Labour economics literature**
  - Pencavel (1986) HLE, vol. 1
  - Heckman and Killingsworth (1986) HLE, vol. 1
  - Blundell and MaCurdy (1999) HLE, vol. 3
- **Public economics literature**
  - Hausman (1985) HPE, vol. 1
  - Moffitt (2003) HPE, vol. 4
- **Econometrics literature**
  - Blundell, MaCurdy and Meghir (1985) HPE, vol. 1

Labour supply elasticities

- **Intensive margin**
  - Primary earners (used to be usually men) have low elasticities (around 0.1).
  - Secondary earners of the household (typically married women) have much higher elasticities (between 0.5 and 1).
- **Extensive margin**
  - Highly educated men have very low participation elasticities
  - Low educated men have modest participation elasticities
  - Married women have much higher elasticities
  - Lone mothers have very high participation elasticities

Labour supply elasticities

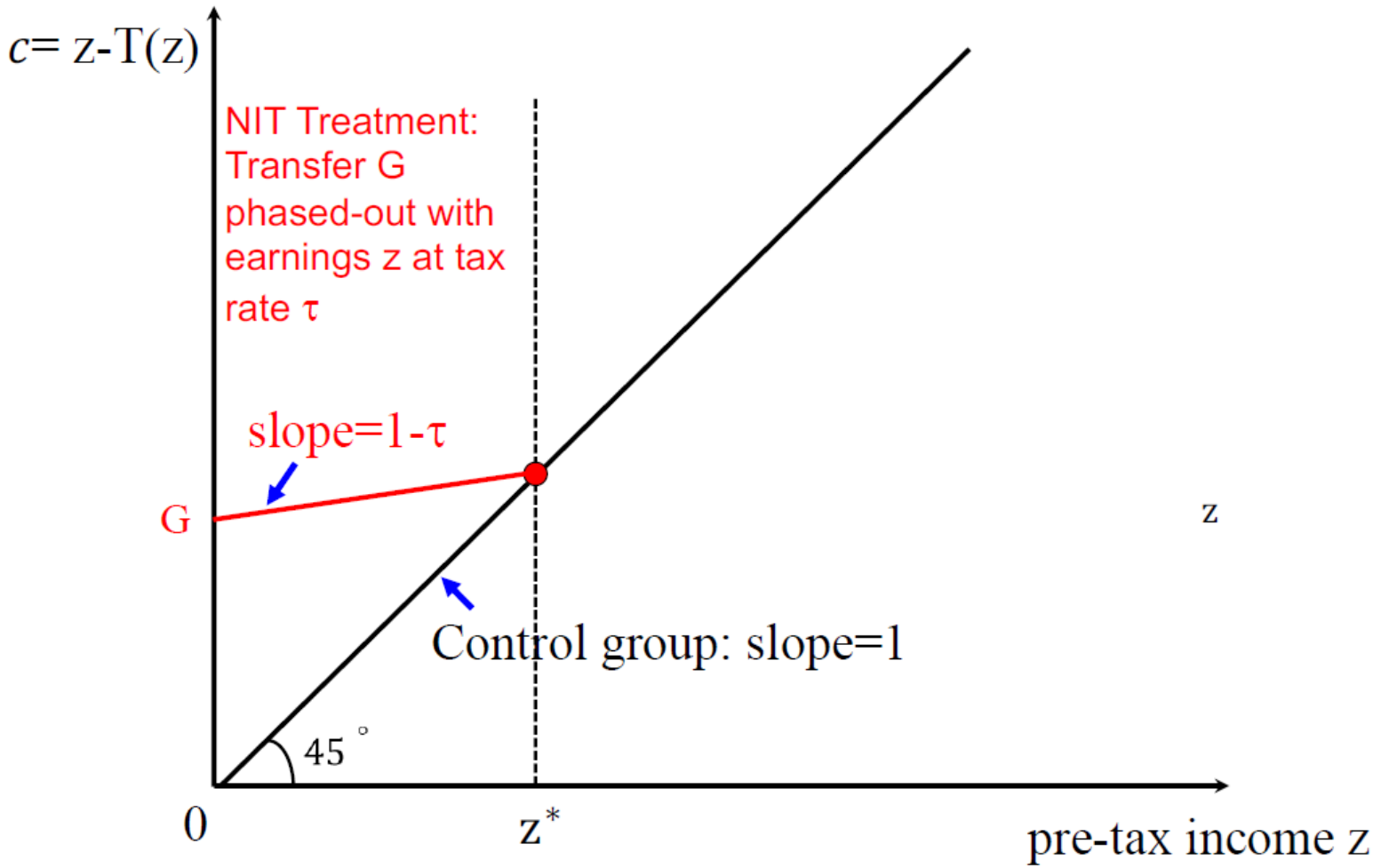
- **Blau and Kahn (JOLE, 2007)**
  - Use grouping instrument on data from 1980-2000
  - Define cells (year/age/education)
  - Identification from group-level variations
- **Results**
  - Married female labour supply elasticity has been falling sharply
    - total hours elasticity : 0.4 in 1980 to 0.2 in 2000
    - effect of husband earnings reduced over time
  - The distinction between primary and secondary earners tends to blur with the increase in female participation

U.S. experiments of NIT (1960s, 1970s)

- **Negative income tax (NIT)**
  - Complex set of cash and in-kind benefits in the U.S. in the 1960s : aim to rationalize the system
  - NIT : guaranteed income payment to all poor households, gradually reduced with earnings
  - Fear that NIT will reduce labour supply

- **Experimenting different designs of NIT**
  - Two parameters : lump-sum grant G and phaseout rate τ
  - Benefit $B(G, \tau)$ defined for households with income Y :
    $B = G - \tau Y$ if $Y < \frac{G}{\tau}$
    $B = 0$ if $Y > \frac{G}{\tau}$
    - $\frac{G}{\tau}$ is the break-even point
    - τ is the marginal tax rate

Figure 30 – Negative income tax experiment



Source : Emmanuel Saez, Graduate Public Economics, slides "labour supply".

U.S. experiments of NIT (1960s, 1970s)

- **Income Maintenance Experiments**
  - First major social experiments in the U.S.
  - Four large randomized controlled trials (RCT) :
    1. New Jersey and Pennsylvania (1968-1972)
    2. Iowa and North Carolina (1969-1973)
    3. Gary, Indiana (1971-1974)
    4. Denver and Seattle (1971-1982)
  - Large cost of the experiment (1 billion USD)

- **Experimental design**
  - Several groups with randomization within each
  - Around 75 households per group
  - First analysis : Rees (JHR 1974) ; Munnell (1986)
  - Later estimates : Ashenfelter and Plant (JOLE, 1990)

Randomized controlled trial

Figure 31 – Parameters of the 11 NIT experiments

Program Number	G ($)	τ	Declining Tax Rate	Break-even Income ($)
1	3,800	.5	No	7,600
2	3,800	.7	No	5,429
3	3,800	.7	Yes	7,367
4	3,800	.8	Yes	5,802
5	4,800	.5	No	9,600
6	4,800	.7	No	6,857
7	4,800	.7	Yes	12,000
8	4,800	.8	Yes	8,000
9	5,600	.5	No	11,200
10	5,600	.7	No	8,000
11	5,600	.8	Yes	10,360

SOURCE : Ashenfelter and Plant (1990), Tab. 1.

Randomized controlled trial

- **Ashenfelter and Plant (JOLE, 1990)**
  - Analysis of the Denver and Seattle NIT
  - Present non-parametrics evidence of labour supply effects
  - Compare actual benefits payments to treated households to counterfactual benefit payments to control households
  - Difference in benefits reflects aggregate hours response
- **Results**
  - Significant labour supply response but small
  - Implied earnings elasticities :
    - male : 0.1
    - female : 0.5
  - Response of women concentrated along the extensive margin

Figure 32 – NIT payments treated vs control

G ($)	τ	Declining Tax Rate	Preexperimental Payment ($)	Payments for Year of Experiment ($)			Postexperimental Payment ($)
				1	2	3	
3,800	.5	No	193.78	248.46	368.95*	389.24*	138.56
			(143.45)	(149.58)	(170.75)	(182.99)	(188.20)
3,800	.7	No	124.96	185.18	317.28	218.37	−47.85
			(223.77)	(237.91)	(252.99)	(325.57)	(314.66)
3,800	.7	Yes	−33.37	68.94	158.44	324.84	29.28
			(178.05)	(176.07)	(213.59)	(230.50)	(222.42)
3,800	.8	Yes	75.40	336.06	221.54	160.83	91.52
			(229.44)	(237.18)	(245.92)	(264.53)	(261.84)
4,800	.5	No	52.02	85.17	294.55	337.23	70.22
			(192.31)	(184.85)	(201.73)	(221.73)	(219.58)
4,800	.7	No	220.76	288.33	496.85*	543.25*	178.32
			(160.04)	(169.04)	(197.88)	(204.50)	(194.03)
4,800	.7	Yes	136.99	281.98*	423.30*	348.03*	23.96
			(127.36)	(137.19)	(157.51)	(162.38)	(140.58)
4,800	.8	Yes	−16.87	305.09	417.90	317.39	121.47
			(175.54)	(209.24)	(234.32)	(274.11)	(239.59)
5,600	.5	No	−163.12	200.75	664.41*	717.15*	124.93
			(252.05)	(258.13)	(283.28)	(280.65)	(287.04)
5,600	.7	No	−59.97	23.34	386.12	744.94*	267.69
			(164.95)	(156.41)	(200.59)	(263.80)	(259.45)
5,600	.8	Yes	−27.64	−51.03	117.85	273.44	121.53
			(121.47)	(126.67)	(138.52)	(157.96)	(169.26)

NOTE : Standard errors are in brackets ; * denotes mean is more than twice its standard error.
SOURCE : Ashenfelter and Plant (1990), Tab. 3, p. 405.

Randomized controlled trial

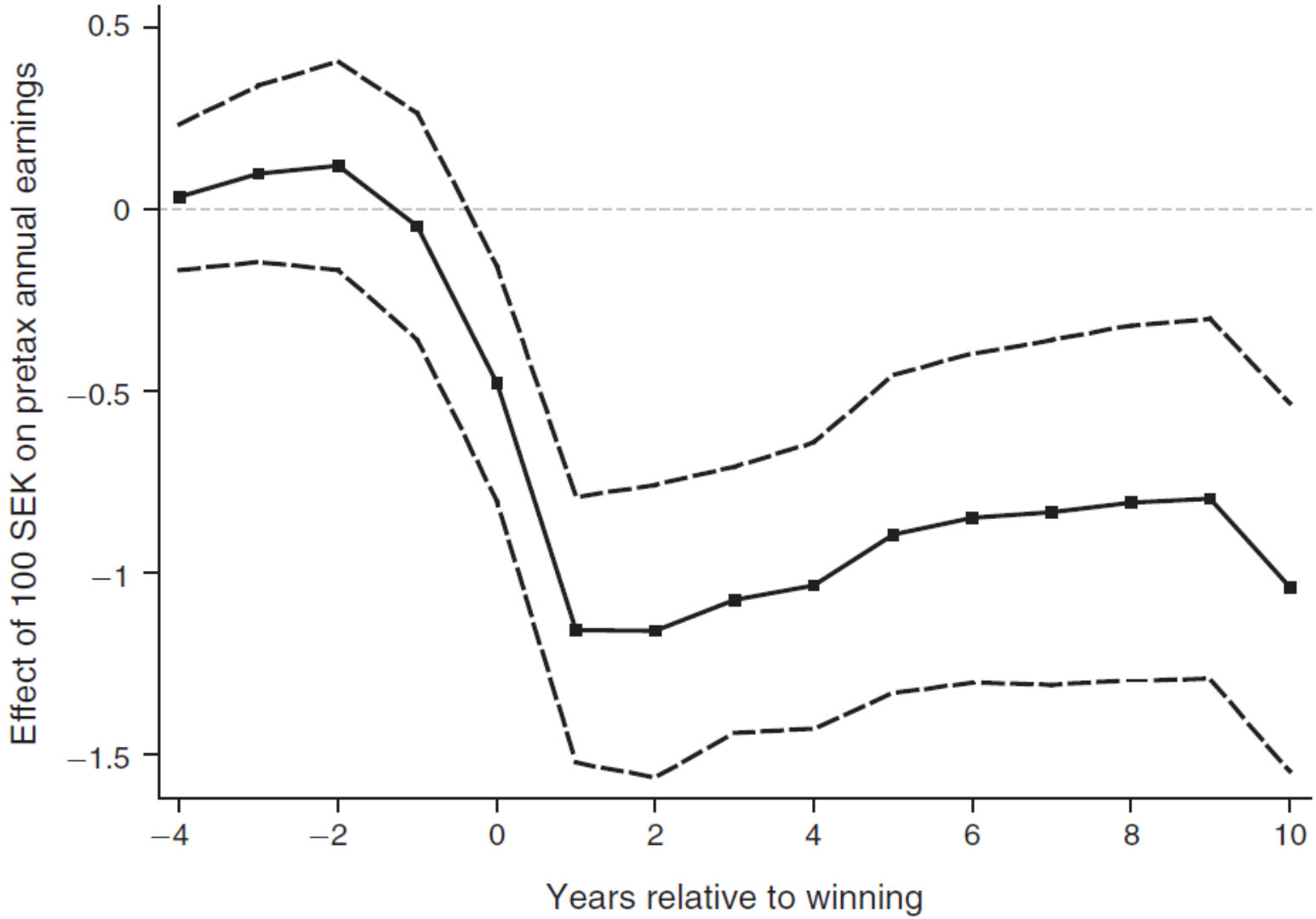
- **Shortcomings of the NIT experiments**
  - Self-reported earnings (with incentives to under-report earnings)
  - Selective attrition (no incentives to report when above breakeven point)
  - GE effects
- **Shortcomings of the analysis**
  - No distinction between extensive/intensive margin
  - No separate estimation of income effects vs substitution effects
  - Hard to identify the key elasticity relevant for policy purposes

Lottery and income effects

- **Cesarini, Lindqvist, Notowidigdo and Östling (AER, 2017)**
  - Universe of Swedish lottery winners and non-winners matched with administrative data on earnings
  - Lottery is pretty close to RCT design

- **Key results**
  (i) Effects on both extensive and intensive labor supply margin, persistent over time
  (ii) Significant but small income effects : $\eta \approx -0.10$
  (iii) Effects on spouse but not as large as on winner
  $\Rightarrow$ Rejects the unitary model of household labor supply

Figure 33 – Effect of Wealth on Individual Gross Labor Earnings



Sources : Cesarini et al. (2017), Fig. 1, p. 3926.

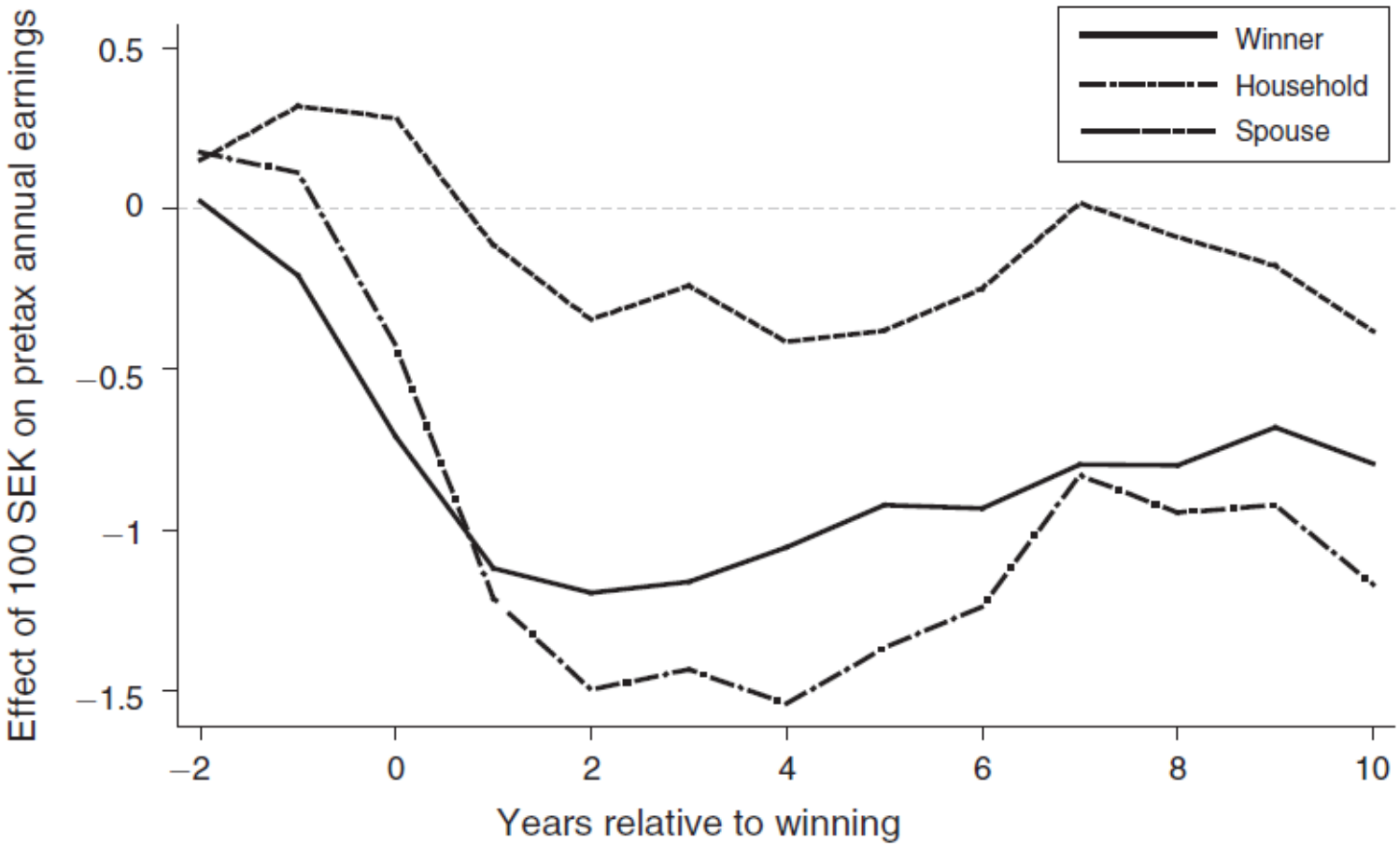
Lottery and income effects

Figure 34 – Margins of Adjustments

	Panel A. Extensive margin			*Panel B. Retirement*		*Panel C. Hours and wages*	
	Labor earnings (1)	Wage earnings (2)	Self-empl. income (3)	Pension income (4)	Quit work before 65 (5)	Weekly hours (6)	Monthly wage (7)
Effect (million SEK)	−2.015	−2.241	−0.139	0.951	3.302	−1.282	−147.3
SE	(0.435)	(0.473)	(0.202)	(0.658)	(1.420)	(0.247)	(84.2)
p	[<0.001]	[<0.001]	[0.491]	[0.148]	[0.020]	[<0.001]	[0.080]
Mean	0.78	0.71	0.05	0.50	0.51	32.8	22,999
Effect/mean	−2.60	−3.15	−2.63	1.91	6.43	−3.91	−0.64
Observations	244,826	244,826	244,826	89,980	74,718	108,919	108,919

SOURCES : Cesarini et al. (2017), Tab. 4, p. 3929.

Figure 35 – Effect of Wealth on Earnings of Married Winners and Spouses



Sources : Cesarini et al. (2017), Fig. 5, p. 3942.

Baseline dynamic model

- **Intertemporal or Frisch elasticity of labour supply**
  - Multiperiod setting, with optimal choice of labour supply across periods
  - Frisch labour supply functions hold elasticity of wealth constant
  - Frisch elasticity is larger than Hicksian and Marshallian elasticities
- **Interpretation and use**
  - How much more are people willing to work when their wage increases temporarily
  - Key parameter in macro models : it amplifies the effects of productivity shocks on labor supply and economic activity

Experience of tax holiday

- **Tax holiday in Iceland**
  - In 1986, Iceland announced major reform to income tax
    1. Move to tax withholding in 1988 (pay-as-you-earn)
    2. Change of tax schedule with lower marg. tax rate and higher tax-free allowance
  - To avoid double taxation during transition, no tax charged over 1987 incomes
    - 1986, average tax rate 14.5%
    - 1987, average tax rate 0%
    - 1988, average tax rate 8%

- **Bianchi, Gudmundsson and Zoega (AER, 2001)**
  - Exploit the 1987 no tax experiment : large and salient tax variation $\triangle log(1 - MTR) \simeq 49\%$
  - Data : individual tax returns matched with data on weeks worked from insurance database

Bianchi, Gudmundsson and Zoega (AER, 2001)

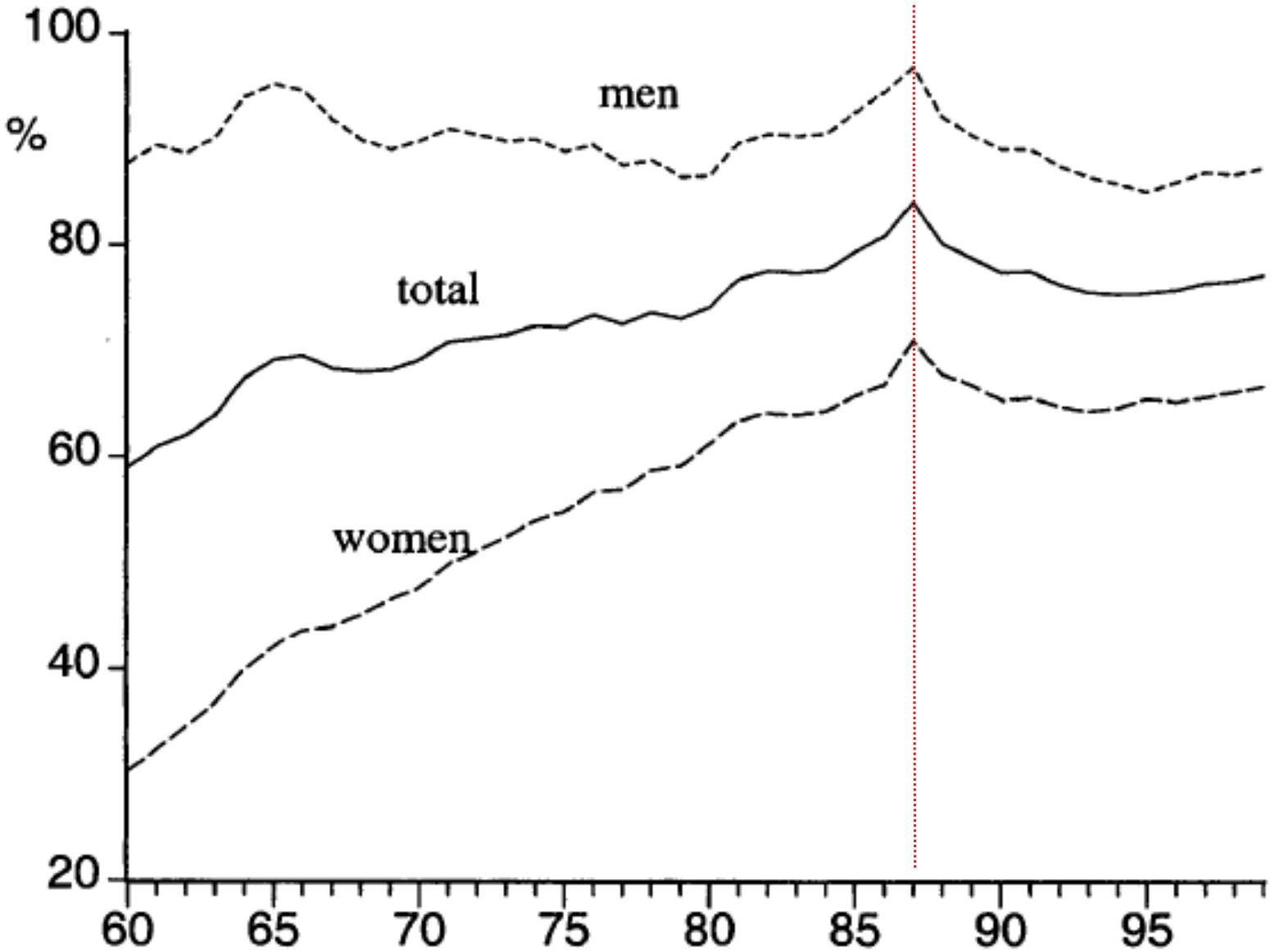
- **Identification : no counterfactual**
  - Estimate 1987 effect by comparing to average of 1986 and 1988
  - Compute elasticities with respect to weeks worked η_L and earnings η_E

$$\eta_L = \frac{\sum(L_{87} - L_A)/L_A}{\sum T_{86}/E_{86}}$$

  - Elasticities computed w.r.t. average tax rates (not clear whether Frisch/Hicksian elasticities)

- **Results**
  - Relatively high elasticities, $\eta_L = 0.42$ and $\eta_E = 0.80$
  - Context of booming economy
  - Iceland sold tax holiday as opportunity to work more

Figure 36 – The Employment Rate in Iceland (1960–1996)

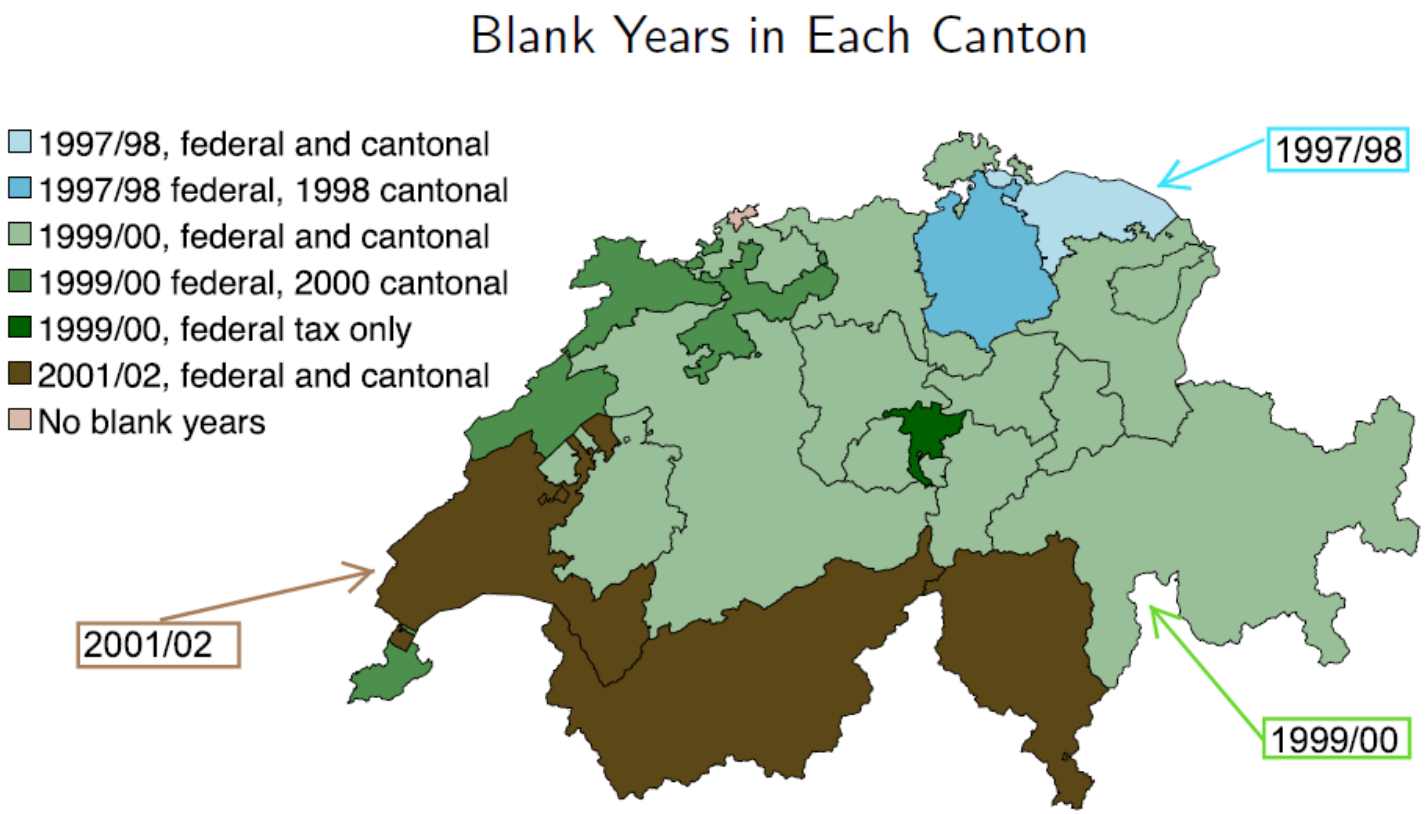


Source : Bianchi, Gudmundsson and Zoega (2001), Fig. 1, p. 1565.

Experience of tax holiday

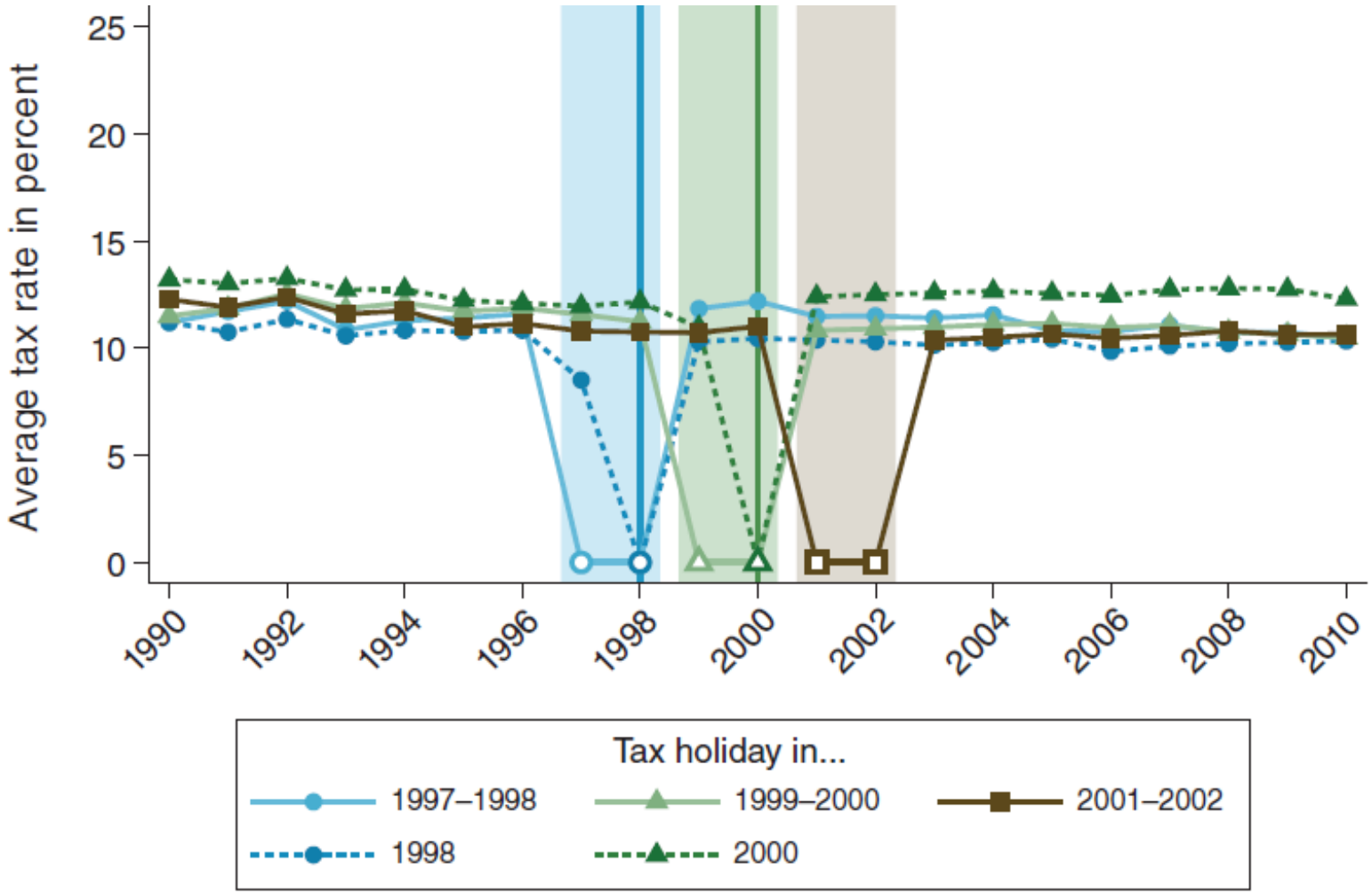
- **Tax holiday in Switzerland**
  - 1990, Switzerland decided to move to pay-as-you-earn
    1. Change from two-years lag income to current income
    2. Two years tax holidays when change introduced
    3. Canton could choose the date when to introduce the change
  - Cantons decided to change between 1997 and 2001
- **Martínez, Saez and Siegenthaler (AER, 2021)**
  - Exploit across time and cantons variations
  - Identification by DiD and event studies

Figure 37 – Timing of introduction of pay-as-you earn



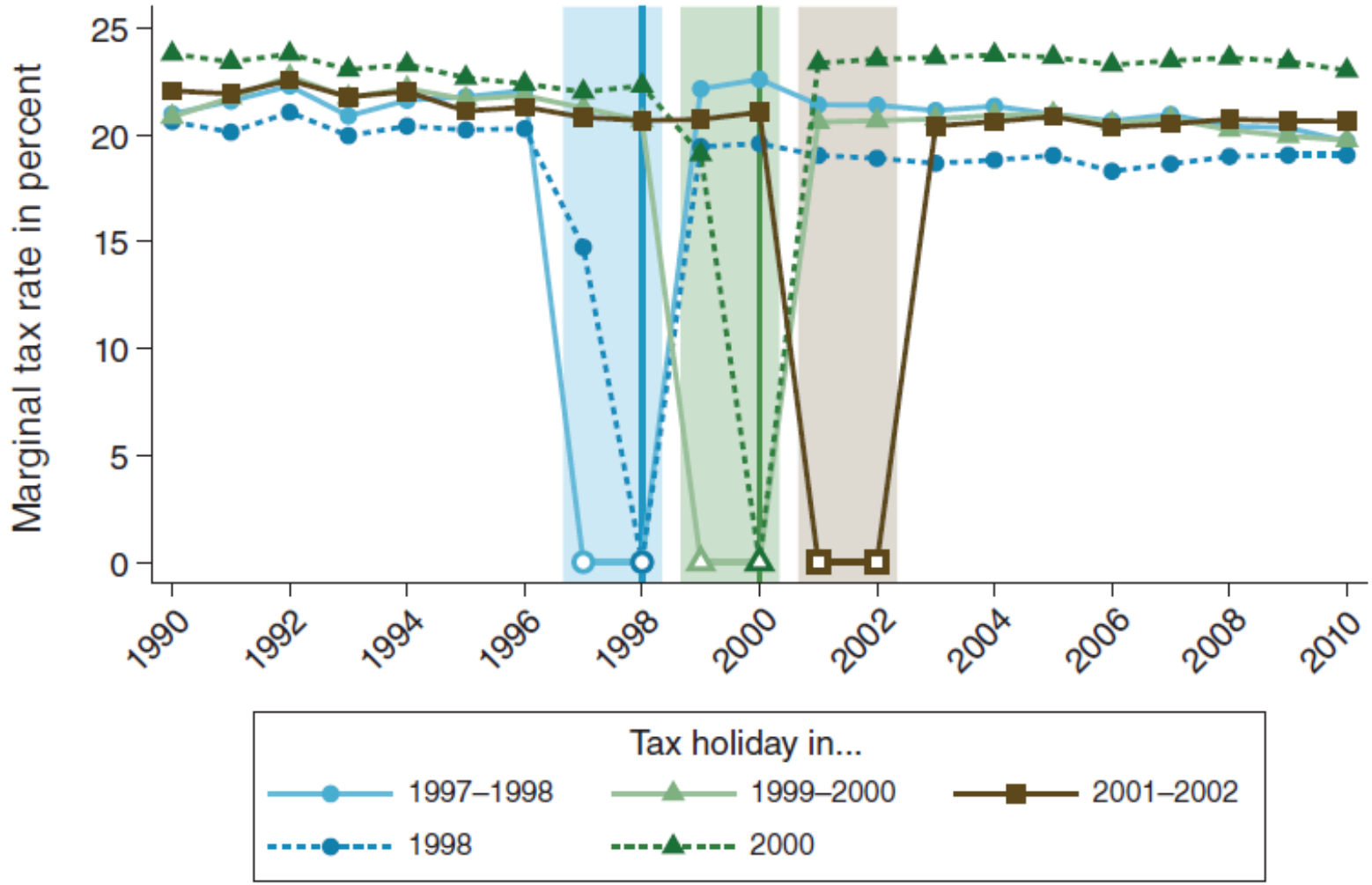
Sources : Martínez, Saez and Siegenthaler (2021), Fig. 1.B, p. 509.

Figure 38 – Effect on average tax rates



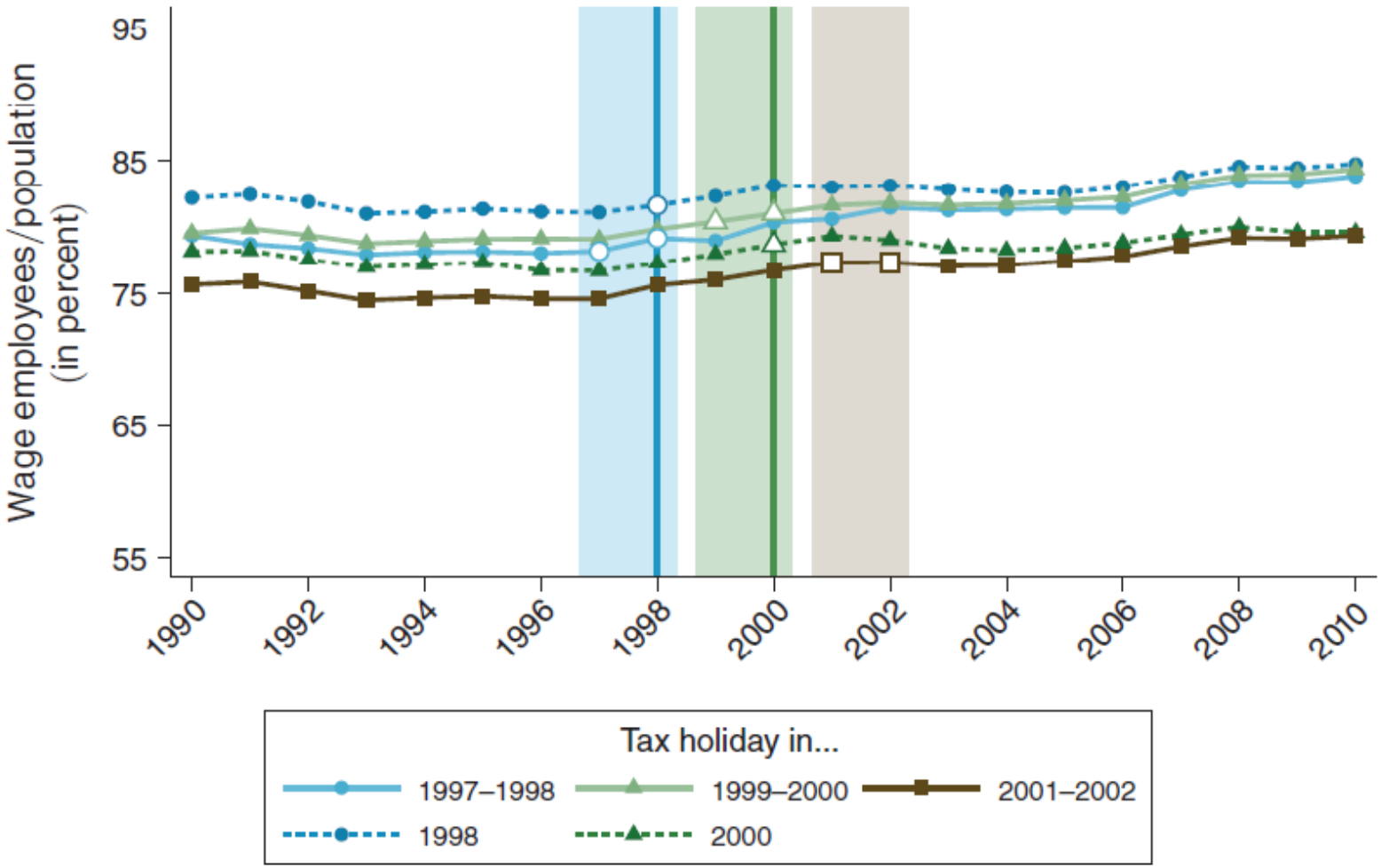
SOURCES : Martínez, Saez and Siegenthaler (2021), Fig. 3.A, p. 522.

Figure 39 – Effect on marginal tax rates



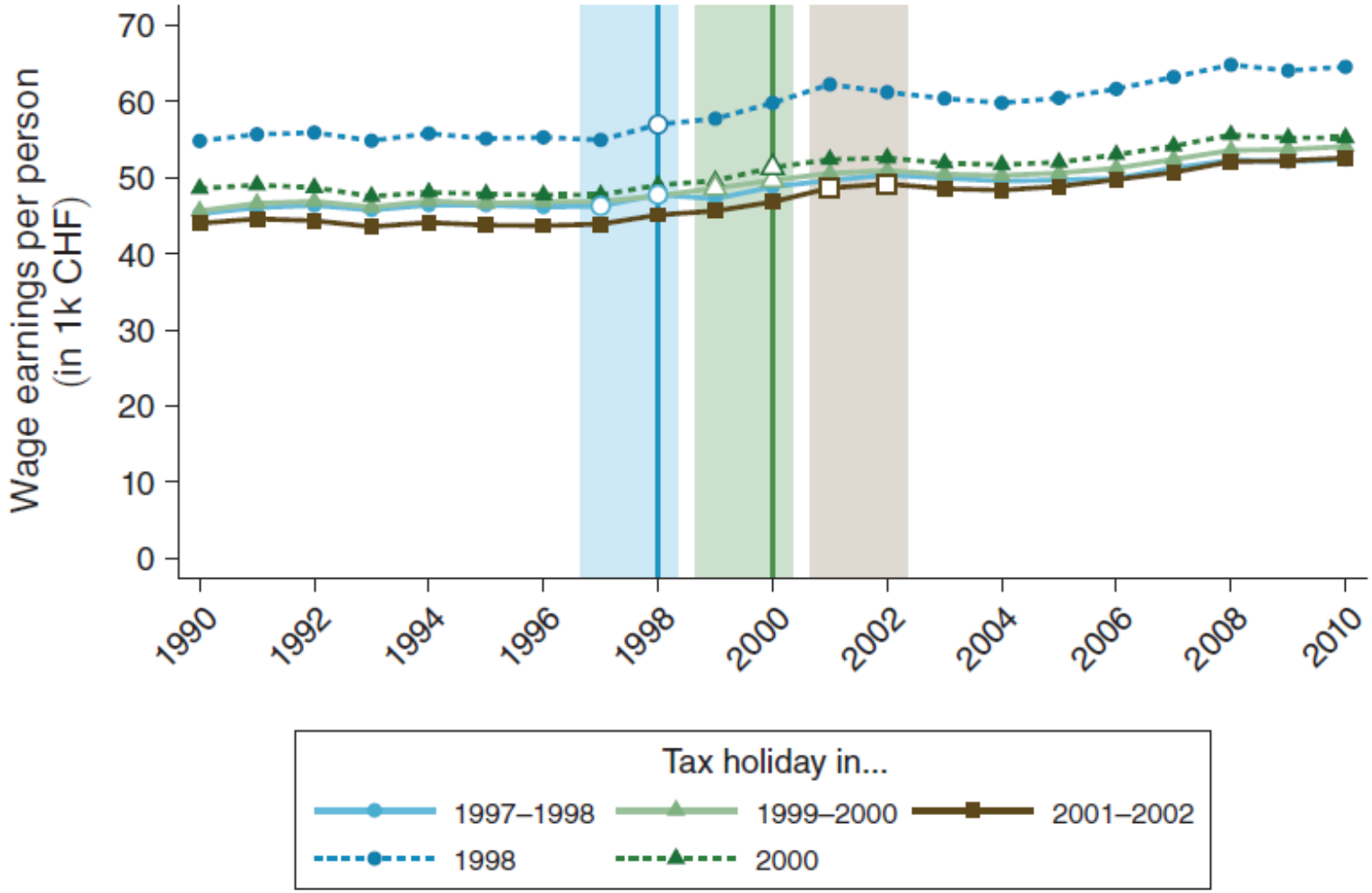
SOURCES : Martínez, Saez and Siegenthaler (2021), Fig. 3.B, p. 522.

Figure 40 – Effect on employment



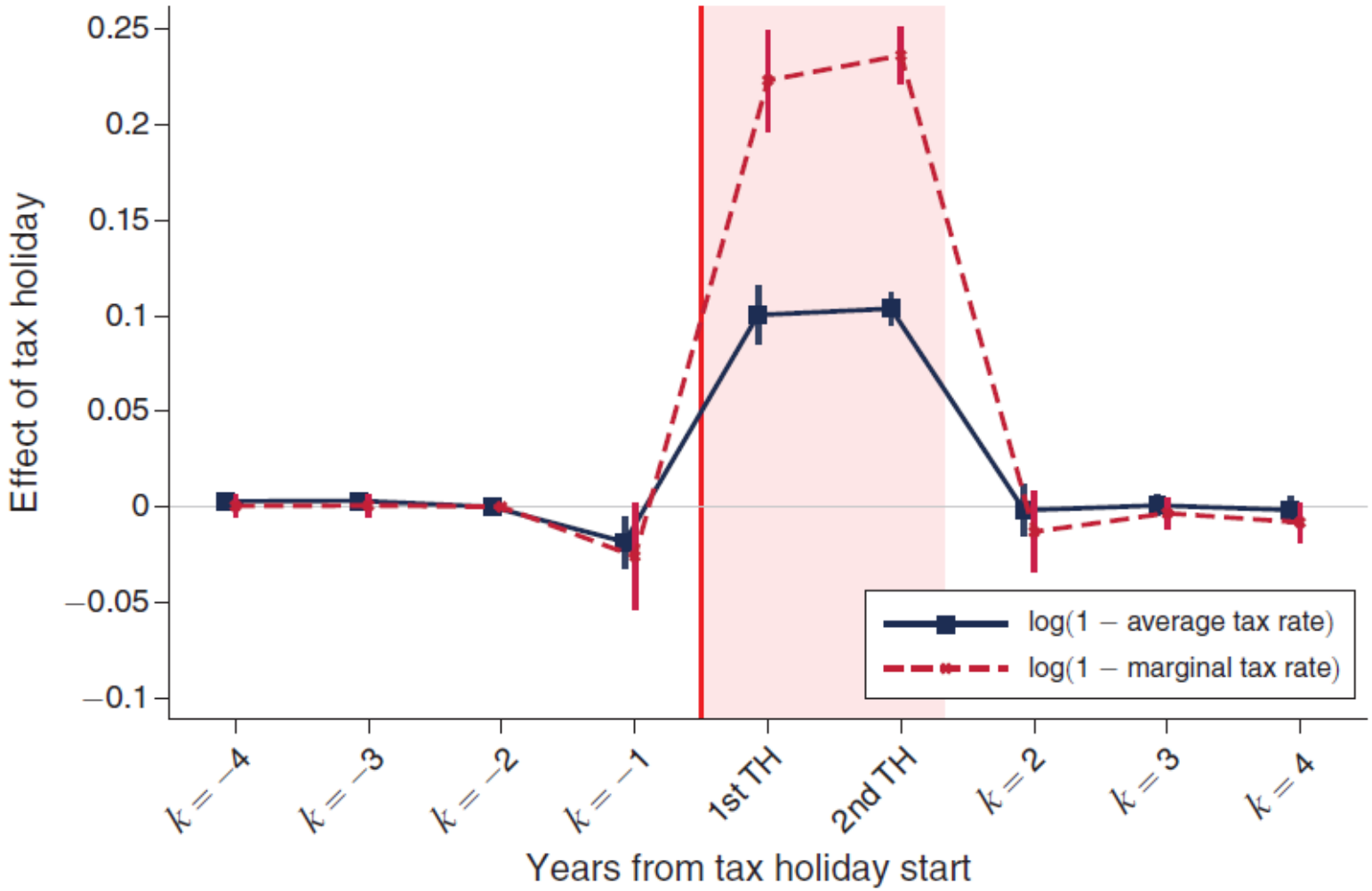
Sources : Martínez, Saez and Siegenthaler (2021), Fig. 5.A, p. 525.

Figure 41 – Effect on earnings



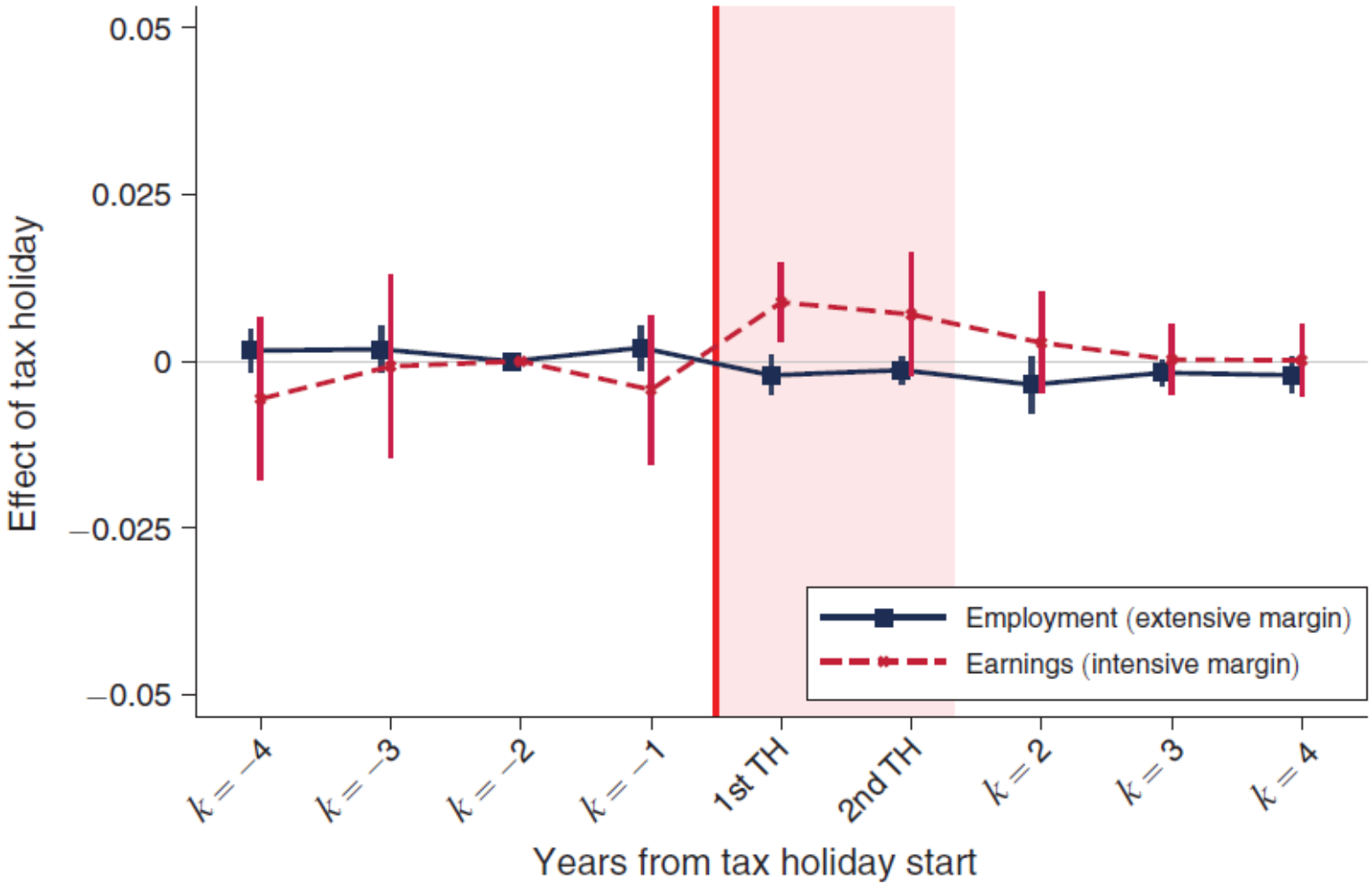
Sources : Martínez, Saez and Siegenthaler (2021), Fig. 5.B, p. 525.

Figure 42 – First stage effect on average and marginal tax rates



Sources : Martínez, Saez and Siegenthaler (2021), Fig. 7.A, p. 525.

Figure 43 – Effect on wage employment and earnings



Sources : Martínez, Saez and Siegenthaler (2021), Fig. 7.B, p. 525.

Figure 44 – Frisch elasticities by level of earnings

	Emp. rate (in %)	Earnings p.p. (incl. 0)	Earnings p. employee	Earnings p. self-empl.
Panel A: 1–25k CHF				
Frisch elasticity η^F	-0.025	0.034	0.070	0.236
25k–50k CHF				
Frisch elasticity η^F	-0.010	0.013	0.020	0.238
50k–100k CHF				
Frisch elasticity η^F	-0.009	0.013	0.018	**0.261****
100k–200k CHF				
Frisch elasticity η^F	-0.001	**0.037****	**0.038****	**0.248*****
More than 200k CHF				
Frisch elasticity η^F	-0.001	**0.086*****	**0.089****	**0.182*****
Observations	105	105	105	80
Canton group FE	Yes	Yes	Yes	Yes
Period FE	Yes	Yes	Yes	Yes

SOURCES : Martínez, Saez and Siegenthaler (2021), Tab. from slides.

Martínez, Saez and Siegenthaler (AER, 2021)

- **Significant but very small Frisch elasticity**
  - Measure Frisch elasticity of 0.05
  - No response along the extensive margin, even for groups less attached to the labor force
  - Self-employed and high income earners display larger responses
- **Implications**
  - Results do not support the idea that the labor supply channel plays a major role in explaining business cycles
  - Marked differences with evidence from Icelandic tax holiday

Macro estimates

- **Macroeconomic approach**
  - Macroeconomists exploit long-term trends or cross-country comparisons
  - Use aggregate data on hours/tax
- **Identification**
  - Calibration technique : find elasticity that best fits the data/model
  - Identification is problematic
  - Similar to regression without controls
  - But perhaps more relevant to long-run policy questions of interest

Macro estimates

- **Edward Prescott**
  - Edward Prescott, American macroeconomist, Nobel prize 2004
    "virtually all of the large differences between U.S. labor supply and those of Germany and France are due to differences in tax systems"

- **Prescott (2004)**
  - Data on hours worked and tax rates for 7 OECD countries
  - Calibration of GE model

$$u(c, l) = c - \frac{l^{1+\frac{1}{\varepsilon}}}{1+\frac{1}{\varepsilon}}$$

  - Find that labour supply elasticity $\varepsilon = 0.7$ best matches times series

Macro estimates

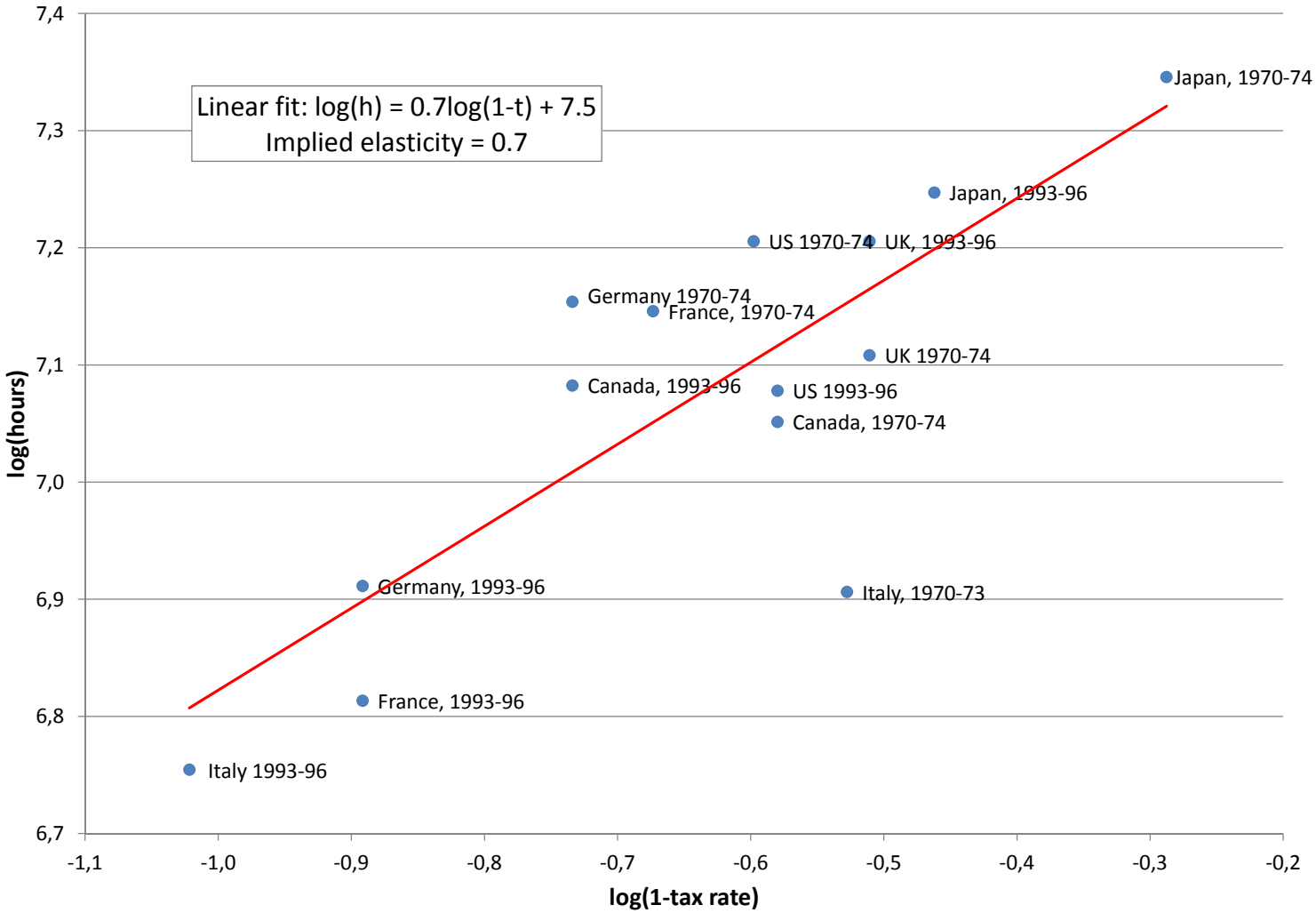
Table 4 – Actual and predicted labour supply (Prescott 2004)

Period	Country	Hours worked		Prediction factors	
		Actual	Predicted	Tax rate	C/Y
1993-96	Germany	19.3	19.5	0.59	0.74
	France	17.5	19.5	0.59	0.74
	Italy	16.5	18.8	0.64	0.69
	Canada	22.9	21.3	0.52	0.77
	U.K.	22.8	22.8	0.44	0.83
	Japan	27.0	29.0	0.37	0.68
	U.S.	25.9	24.6	0.40	0.81
1970-74					
	Germany	24.6	24.6	0.52	0.66
	France	24.4	25.4	0.49	0.66
	Italy	19.2	28.3	0.41	0.66
	Canada	22.2	25.6	0.44	0.72
	U.K.	25.9	24.0	0.45	0.77
	Japan	29.8	35.8	0.25	0.60
	U.S.	23.5	26.4	0.40	0.74

SOURCES : Prescott (2004), Tab. 2.

Macro estimates

Figure 45 – Hours and taxes according to Prescott (2004)



Source : Data from Prescott (2004), Tab. 2.

Macro estimates

- **Macro vs micro estimates**
  - Macro calibrated models need high labour supply elasticities
  - Cross-country evidence suggests high correlation between hours worked and taxes
  - Micro (within country) evidence suggests small elasticities
- **Debate within economists**
  - "Prescott's provocative paper" (Alesina, Glaeser and Sacerdote, 2005)
  - Results confirmed with other calibrations and more data (Ohanian, Raffo and Rogerson, JME, 2008)
  - Prescott Nobel Lecture (JPE, 2006)

Macro vs micro : explanations

1. **Omitted variable**
   - Labour market regulations (Alesina, Glaeser and Sacerdote, 2005)
   - Cultural differences between high tax/low tax countries (Blanchard, 2004 ; Steinhauer, 2013)

2. **Extensive vs intensive margin**
   - "Indivisible labour" (Rogerson, JME 1988 ; Rogerson and Wallenius, JET 2008)

3. **Frictions**
   - Macro-elasticity captures long-term responses which could be larger due to frictions (Chetty, ECA 2012)

4. **Other programmes**
   - Pension systems, education, child care, all affect labour supply at different point in time and for different groups (Blundell, Bozio and Laroque, AER 2011)

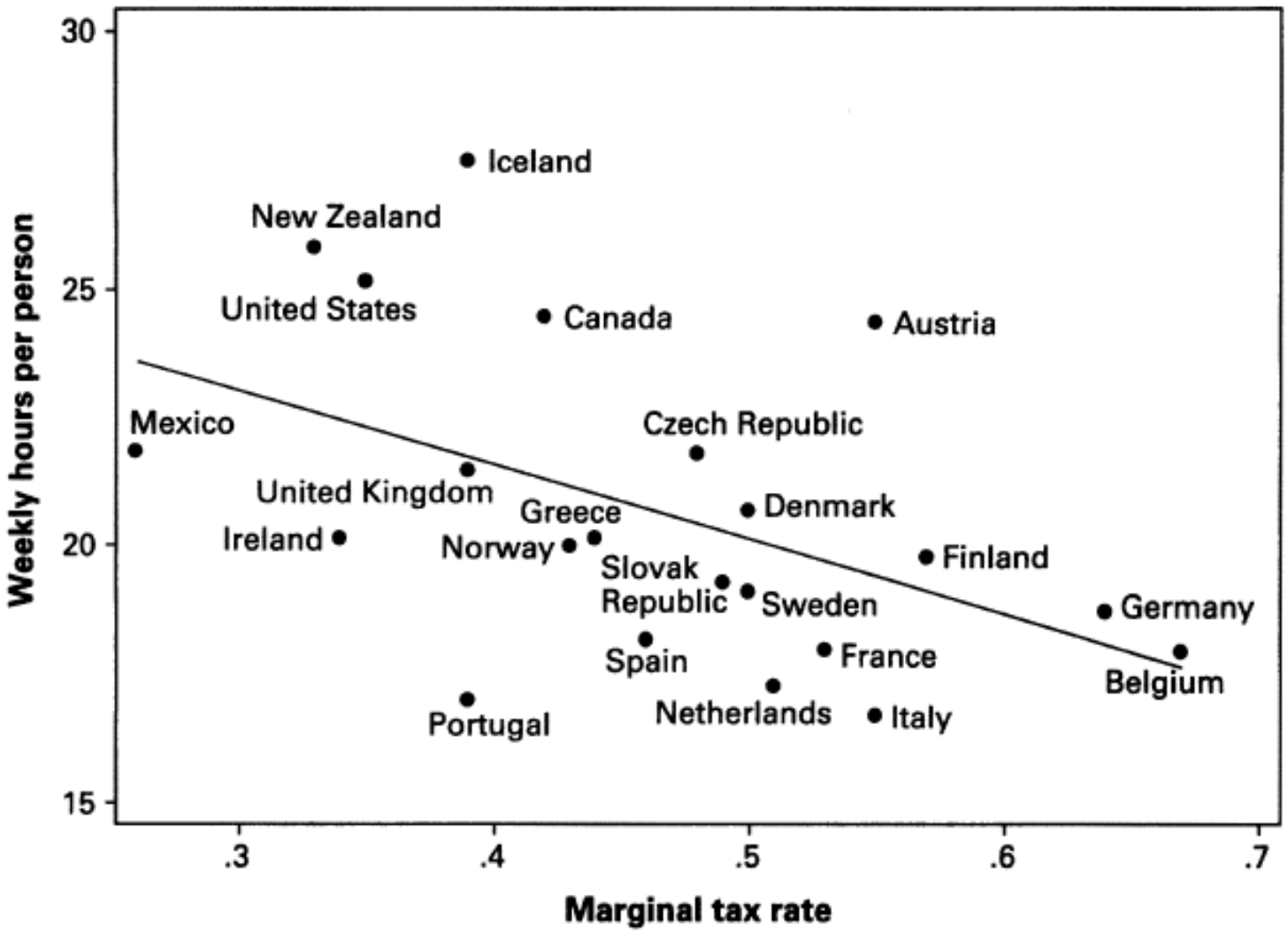
Macro vs micro : omitted variables

- **Alesina, Glaeser and Sacerdote (2005)**
  - Critical of Prescott (2004)
  - Use aggregate OECD data confirming the negative correlation between hours work and tax rates
  - Correlation of high tax level with low inequality, high influence of unions, preferences for holidays

- **Worksharing policies**
  - Unions have bargained for lower hours with the aim of "worksharing"
    e.g., Early retirement policies, 35 hours week, etc.
  - Little impact of taxation on unions' motivation

Macro estimates

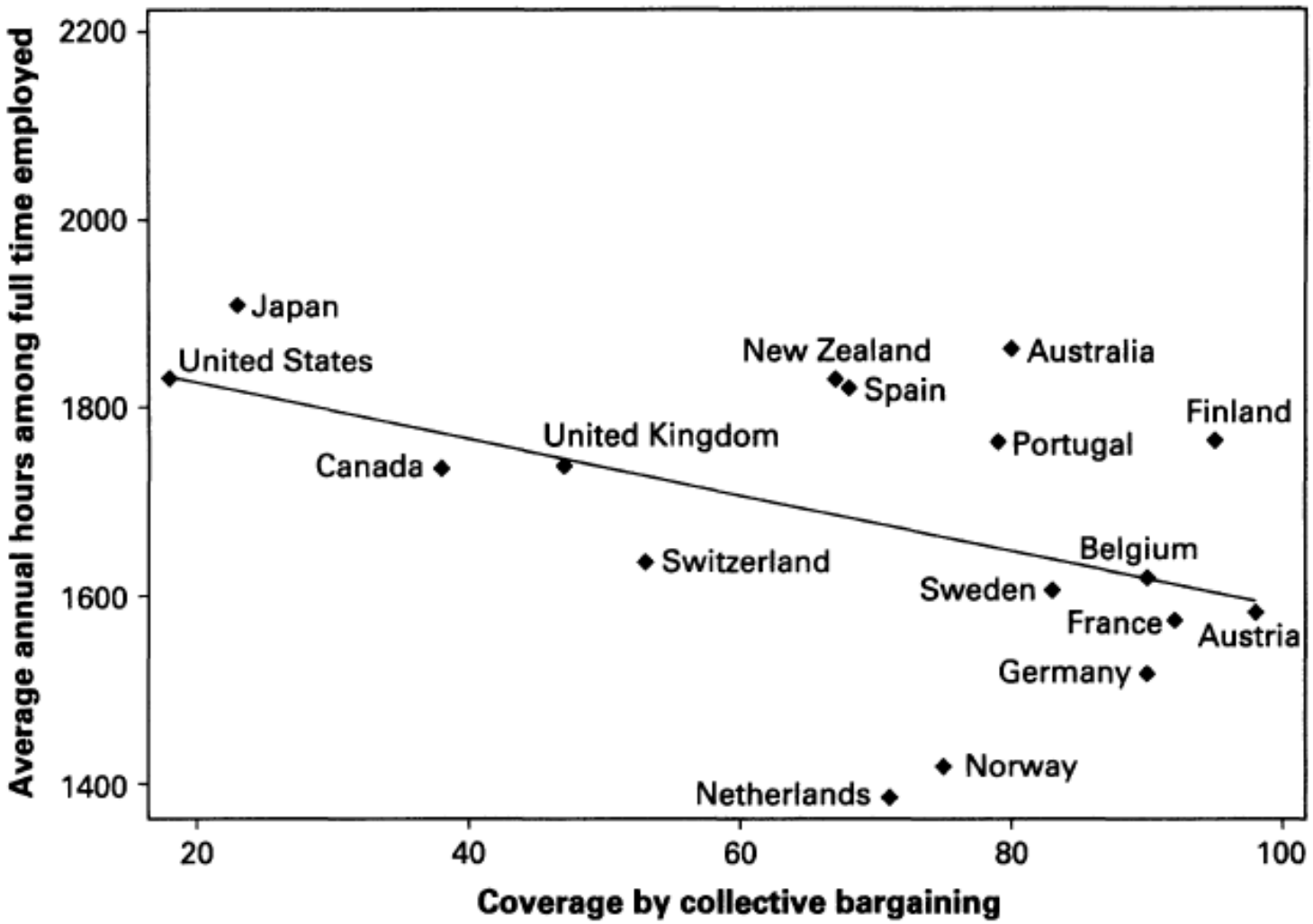
Figure 46 – Hours worked per person and marginal tax rate



Source : Alesina et al. (2005), Fig. 1.5

Macro estimates

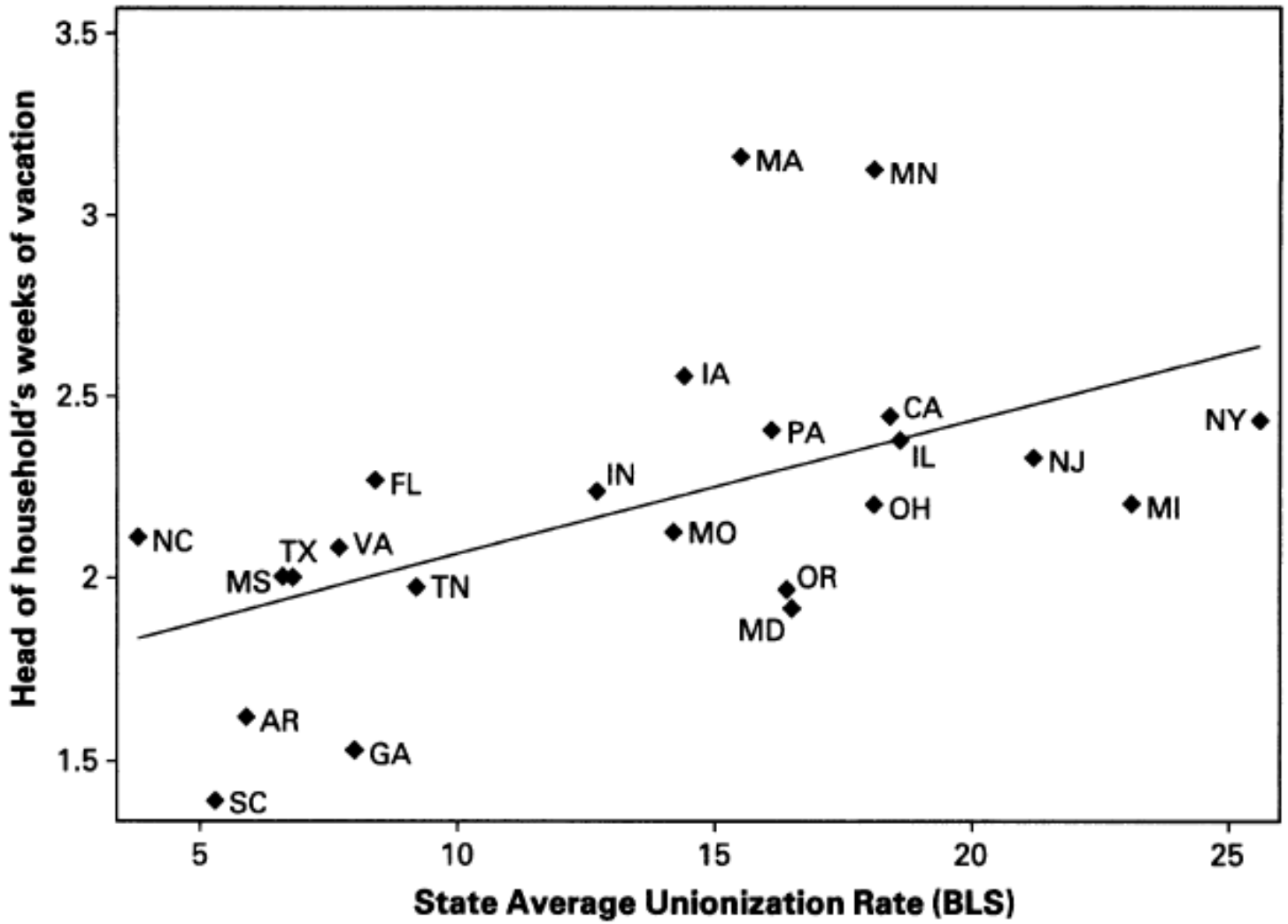
Figure 47 – Hours worked vs collective bargaining agreement



Source : Alesina et al. (2005), Fig. 1.7

Macro estimates

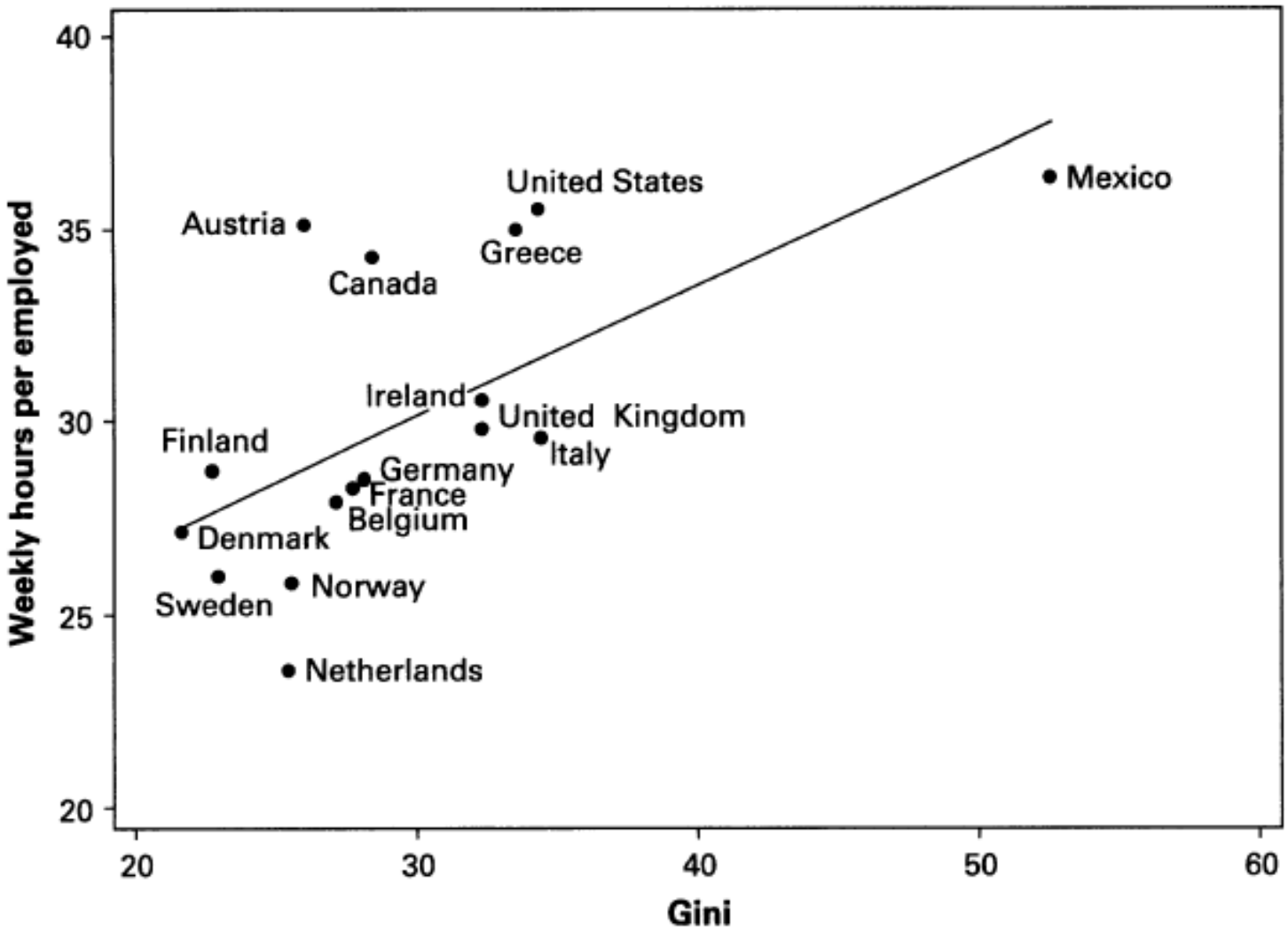
Figure 48 – Days of vacation in the U.S. vs unionization



Source : Alesina et al. (2005), Fig. 1.9

Macro estimates

Figure 49 – Weekly hours per person versus gini



Source : Alesina et al. (2005), Fig. 1.10

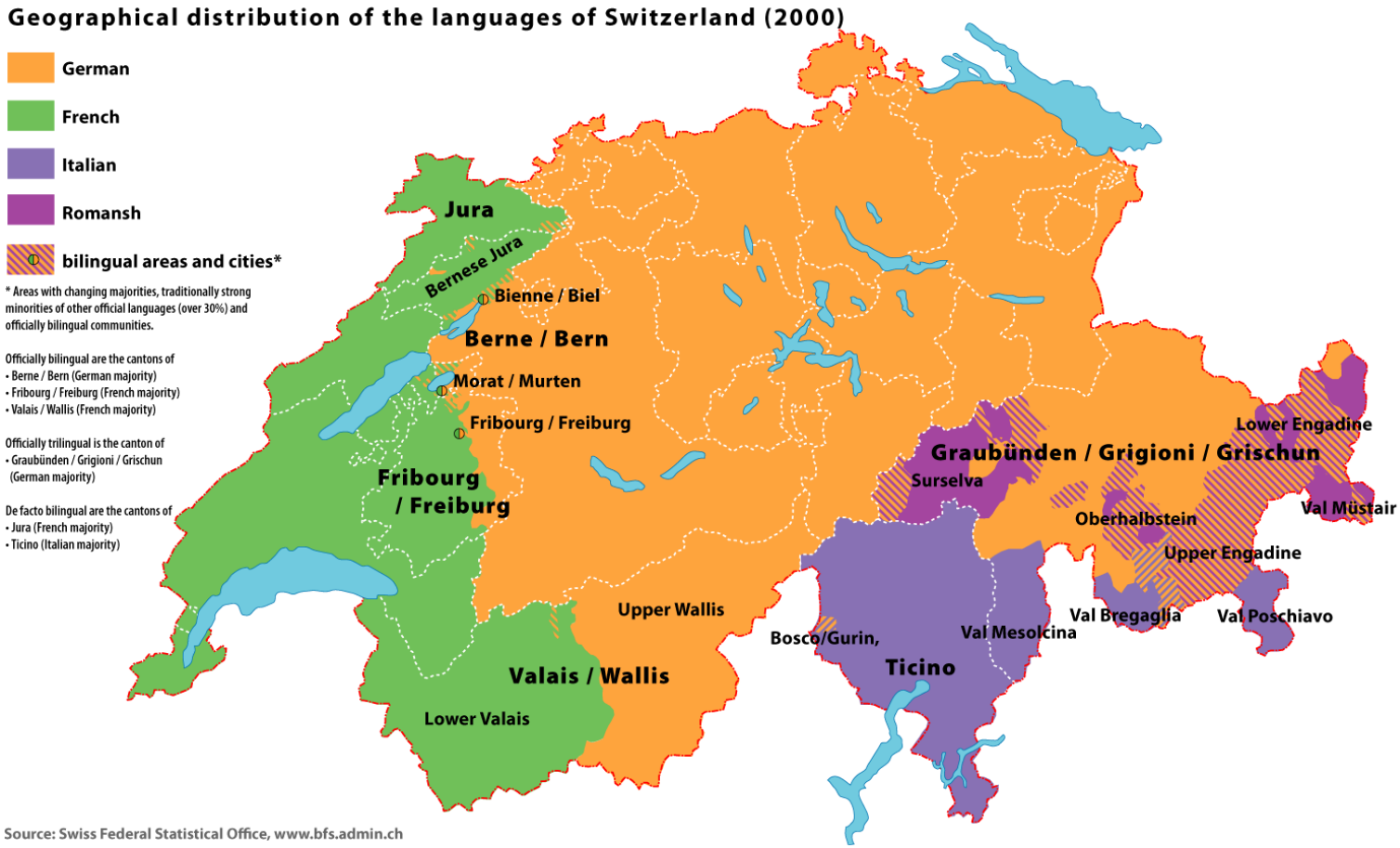
Cultural differences in labour supply

- **Steinhauer (2013) ; Eugster et al. (2017)**
  - Cultural differences could explain different labour supply behaviour
  - Exploit the language difference with Switzerland between German/French speakers
  - RDD along *Röstigraben* (i.e., rösti ditch or in French *barrière du rösti*)

- **Results**
  - Little institutional difference
  - Unemployment duration more prevalent on the French-speaking part
  - No difference by labour demand factors
  - Working mothers more prevalent on the French-speaking side
  - Share of childlessness more prevalent on the German-speaking side

Cultural differences

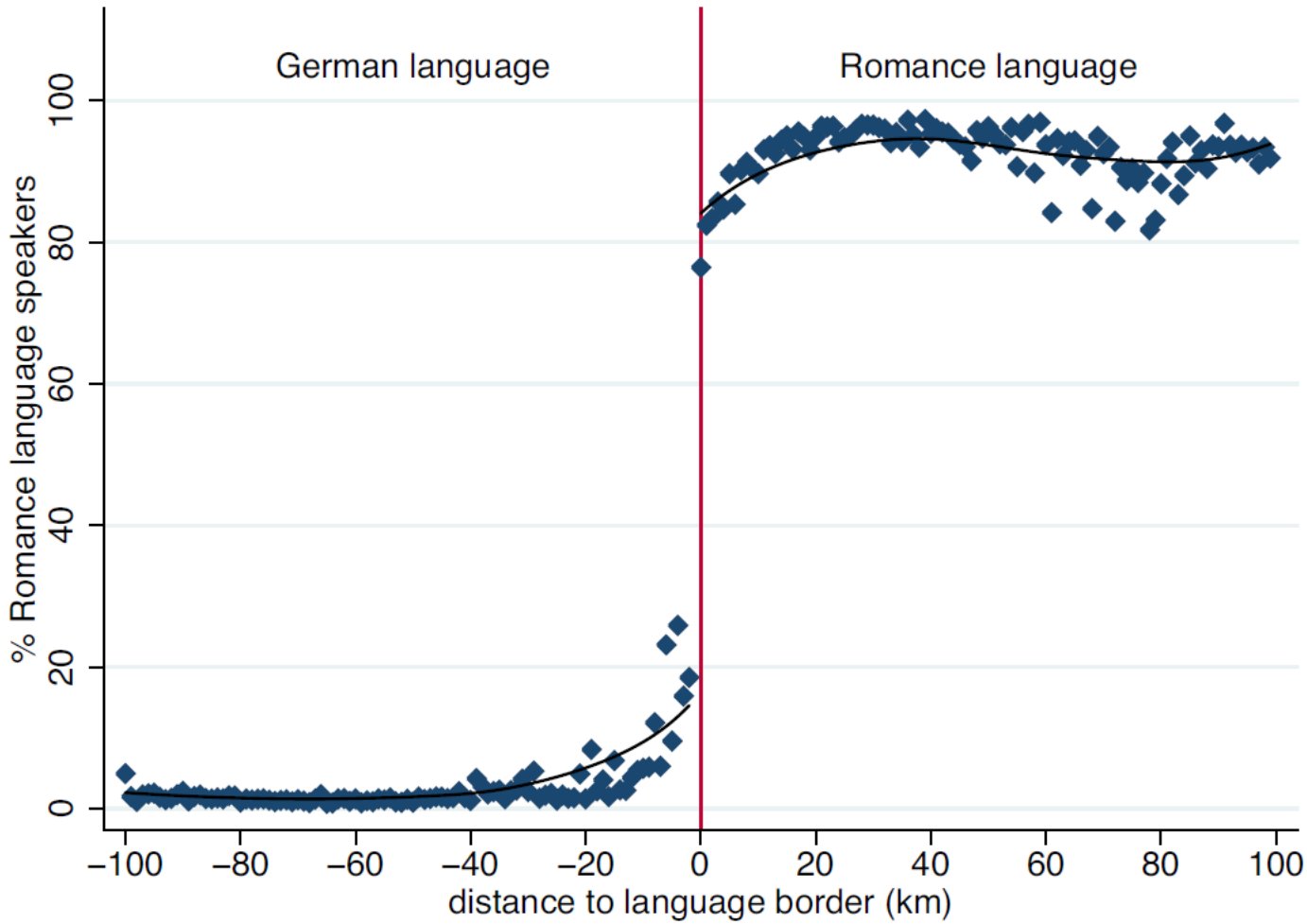
Figure 50 – Map of Switzerland by language



Sources : Marco Zanoli ; Swiss Federal Statistical Office ; census of 2000

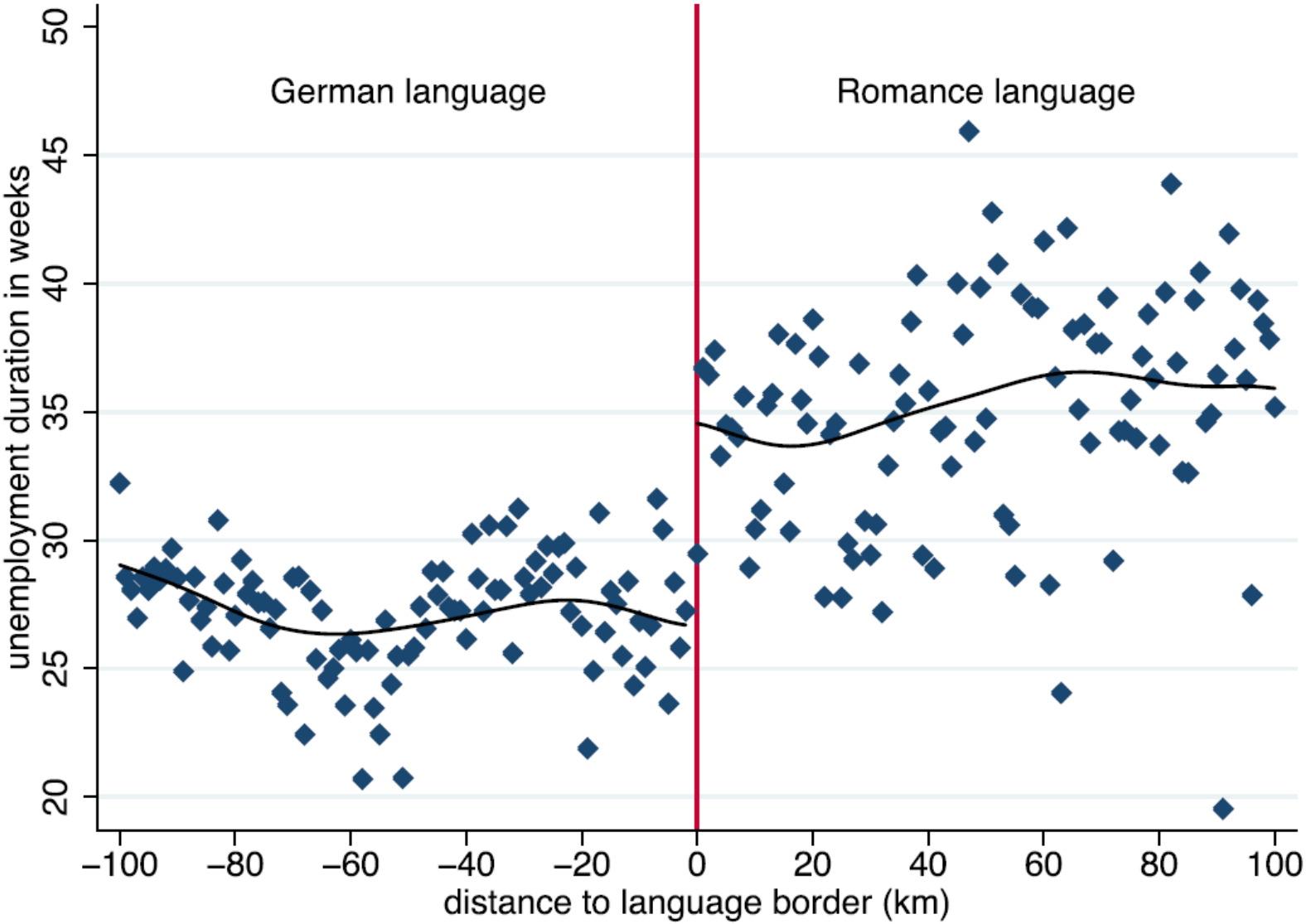
Cultural differences

Figure 51 – Language difference at the Rösti border



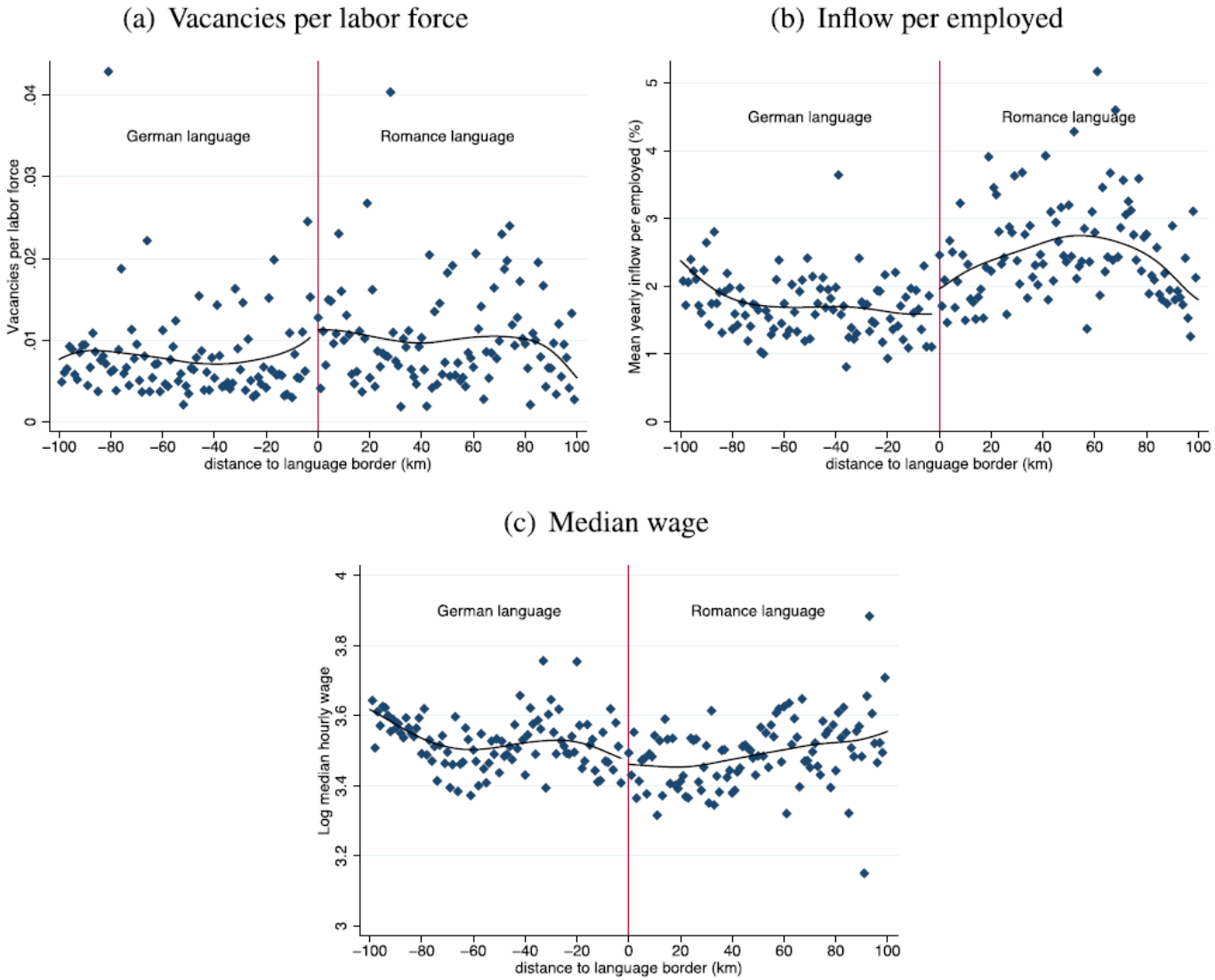
Source : Eugster et al. (2017), Fig. 2, p. 1063.

Figure 52 – Average duration of unemployment at the Rösti border



Source : Eugster et al. (2017), Fig. 4, p. 1074.

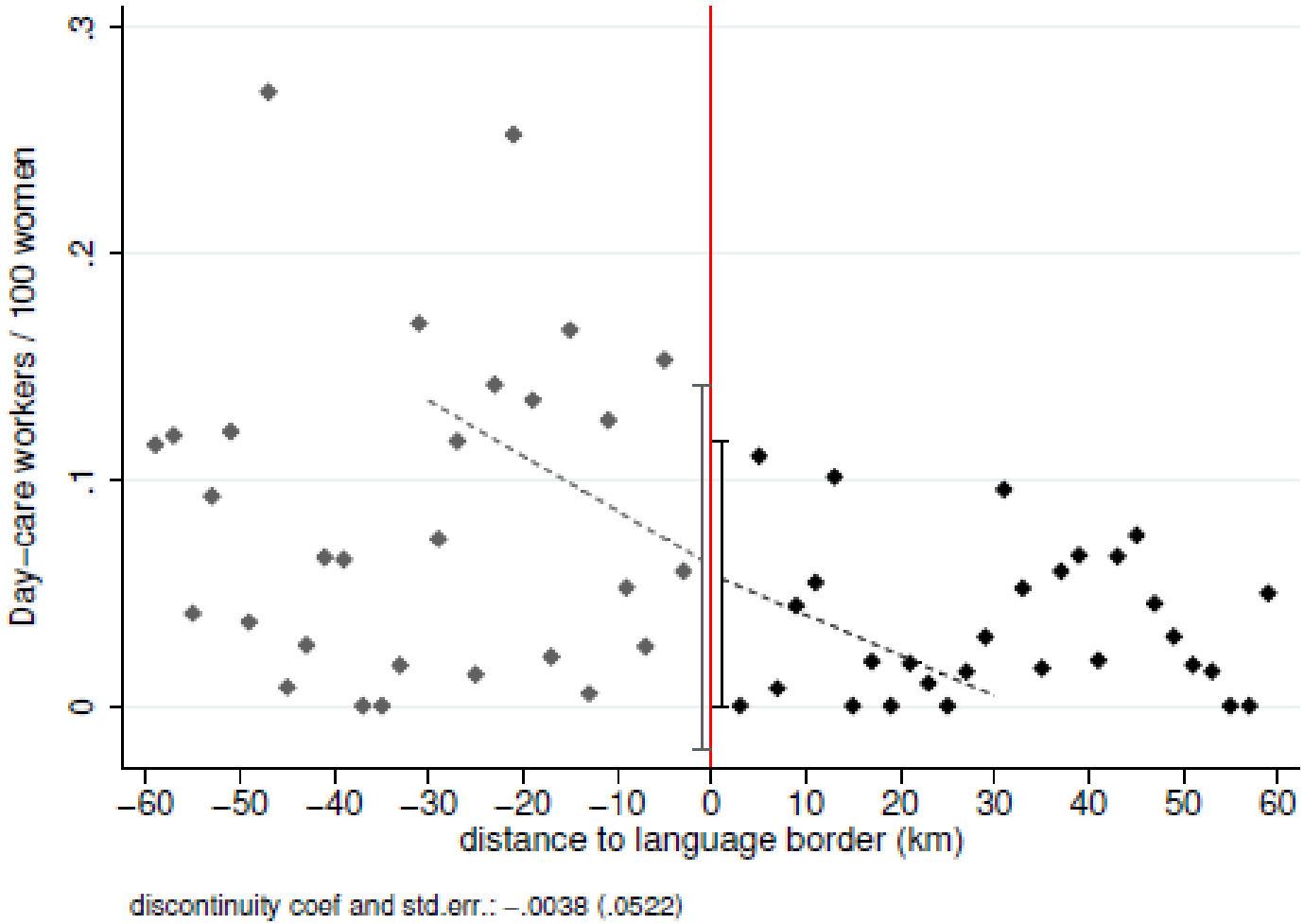
Figure 53 – Labour demand at the Rösti border



SOURCE : Eugster et al. (2017), Fig. 8, p. 1087.

Steinhauer (2013) : working mothers

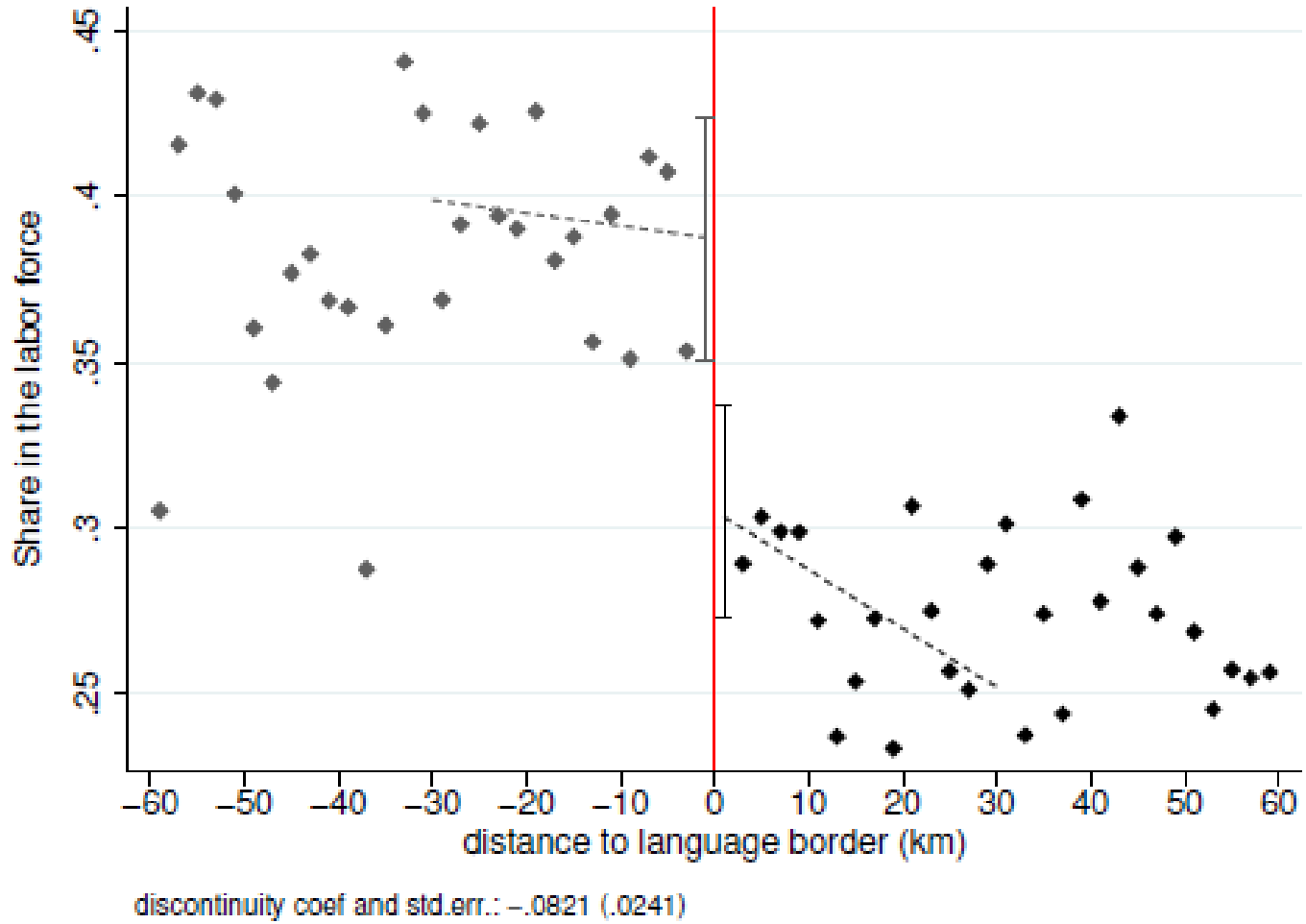
Figure 54 – Day-care supply



NOTE : Swiss French speakers on the left, Swiss German speakers on the right
SOURCE : Steinhauer (2013)

Steinhauer (2013) : working mothers

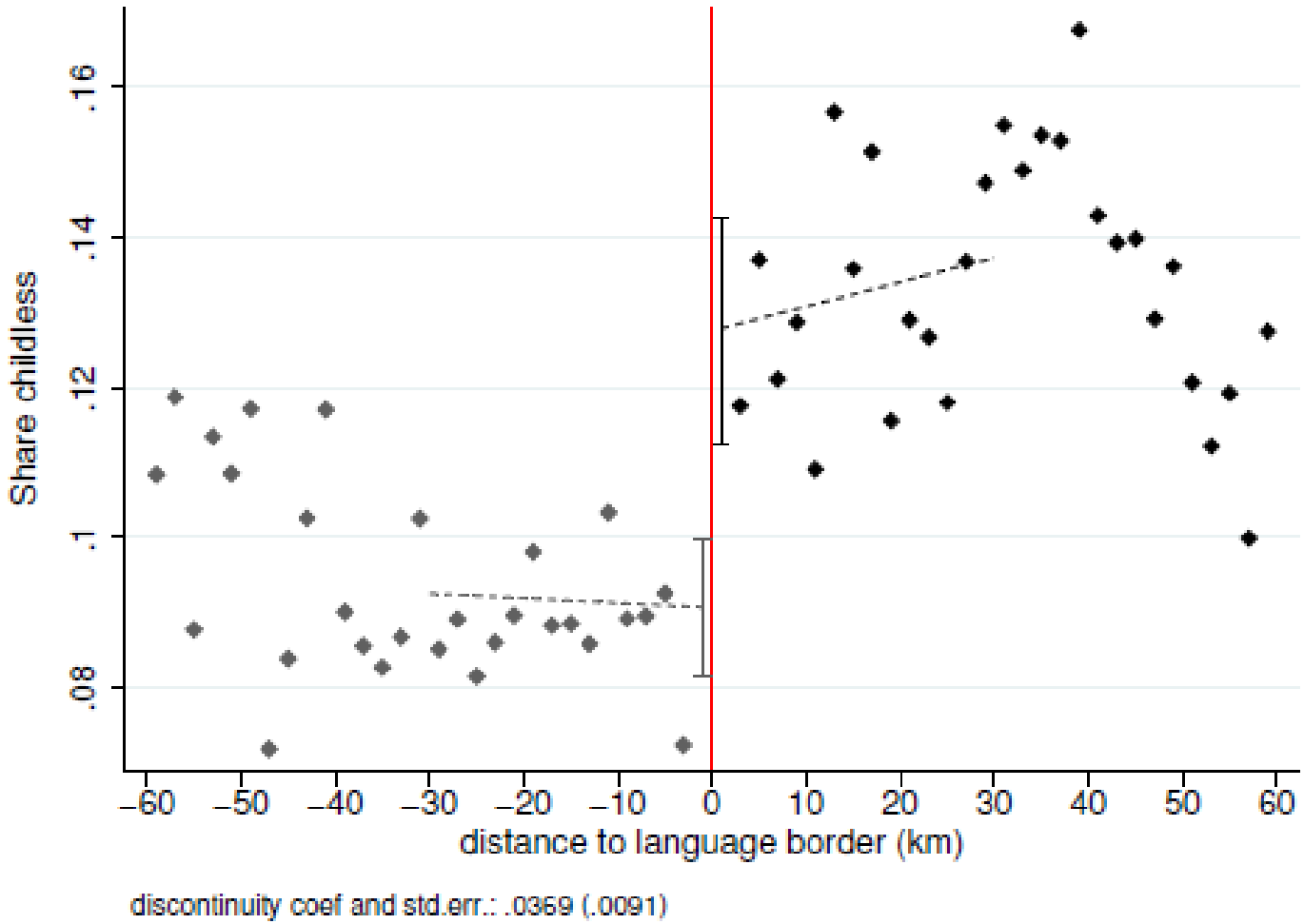
Figure 55 – LFP of mothers of young children



Note : Swiss French speakers on the left, Swiss German speakers on the right
Source : Steinhauer (2013)

Steinhauer (2013) : working mothers

Figure 56 – Share of childlessness



NOTE : Swiss French speakers on the left, Swiss German speakers on the right
SOURCE : Steinhauer (2013)

III. Policy : Transfer to the poor

1. Optimal transfer policy
2. EITC/in-work tax credit

Optimal transfer programmes

- **Two approaches**
  1. Intensive margin : Mirrlees (1971)
  2. Extensive margin : Diamond (JPubE, 1980), Saez (QJE, 2002), Laroque (ECMA, 2005)

- **Mirrlees model : negative income tax**
  - Lump-sum grant $-T(0)$ for those with no earnings
  - High MTR at the bottom :
    a. target transfers (low cost)
    b. intensive response does not generate large losses (earnings low at the bottom)

Optimal transfer programmes

- **Diamond and Saez (JEP 2011)**
  - g_0 social marginal weight on zero earners
  - e_0 elasticity of fraction non-working to the bottom net-of-tax rate
  - Optimal bottom marginal tax rate with intensive margin only

$$\tau_1 = \frac{g_0 - 1}{g_0 - 1 + e_0}$$

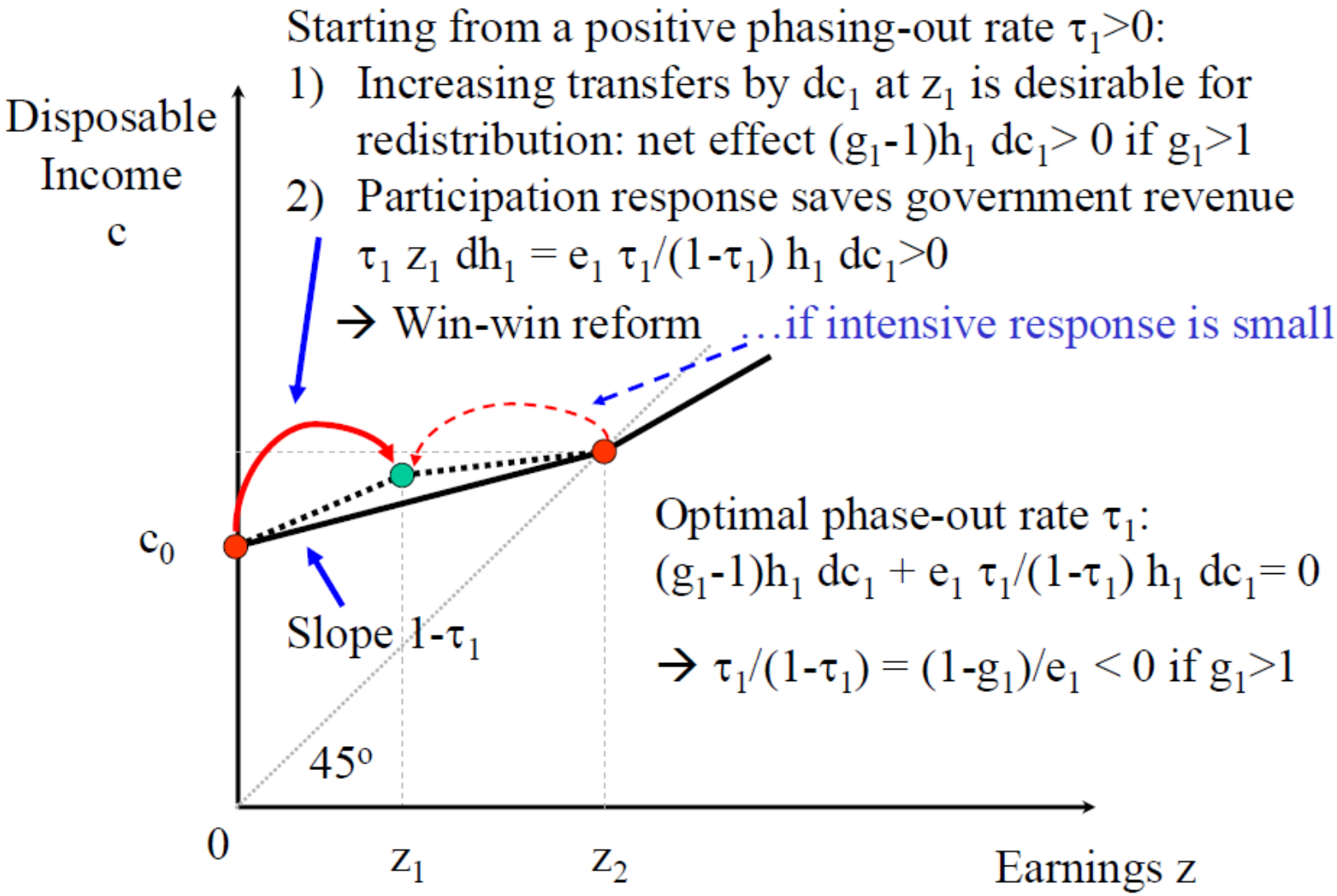
- **Implications of the formula**
  - If society values redistribution towards zero earners, τ_1 will be high
    e.g., with $g_0 = 3$, $e_0 = 0.5$, then $\tau_1 = 80\%$

Optimal transfer programmes

- **Extensive margin responses**
  - With fixed cost of work, extensive margin might be more responsive
  - Empirical literature finds bigger labour supply elasticities at the extensive margin
- **Participation labour supply (Saez, QJE 2002)**
  - Income when working $c_i = w_i - T_i$
  - Income when not working c_0
  - Person works if $c_i - \theta > c_0$, with θ fixed cost of work

Optimal transfer programmes

Figure 57 – Introducing in-work credit



Optimal transfer programmes

- **Results (extensive margin only)**
  - Negative MTR are optimal (i.e., in-work credit are optimal)
  - NIT is not optimal
- **Implications**
  - In practice, both intensive and extensive margin exist
  - Trade-off between negative MTR in phase-in of in-work credit (good for extensive margin) against high MTR in phase-out (bad for intensive margin)

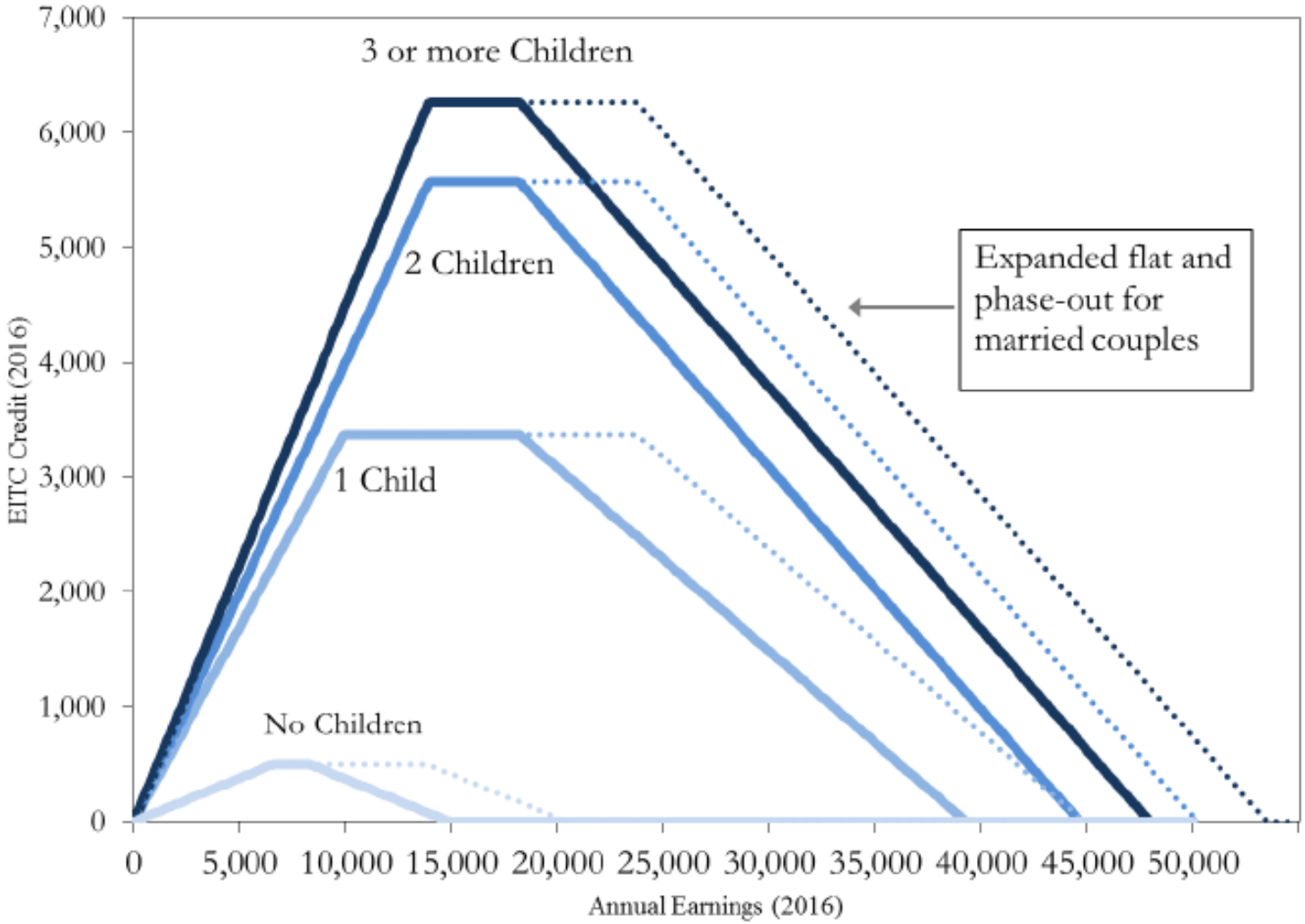
The EITC in the US

- **The Earned Income Tax Credit (EITC)**
  - Large increase under Clinton administration
  - Now the largest cash antipoverty programme in the US ($34.6 billion in 2006)
  - EITC amounts depend on the number of children (higher for families)
  - EITC is computed based on family income

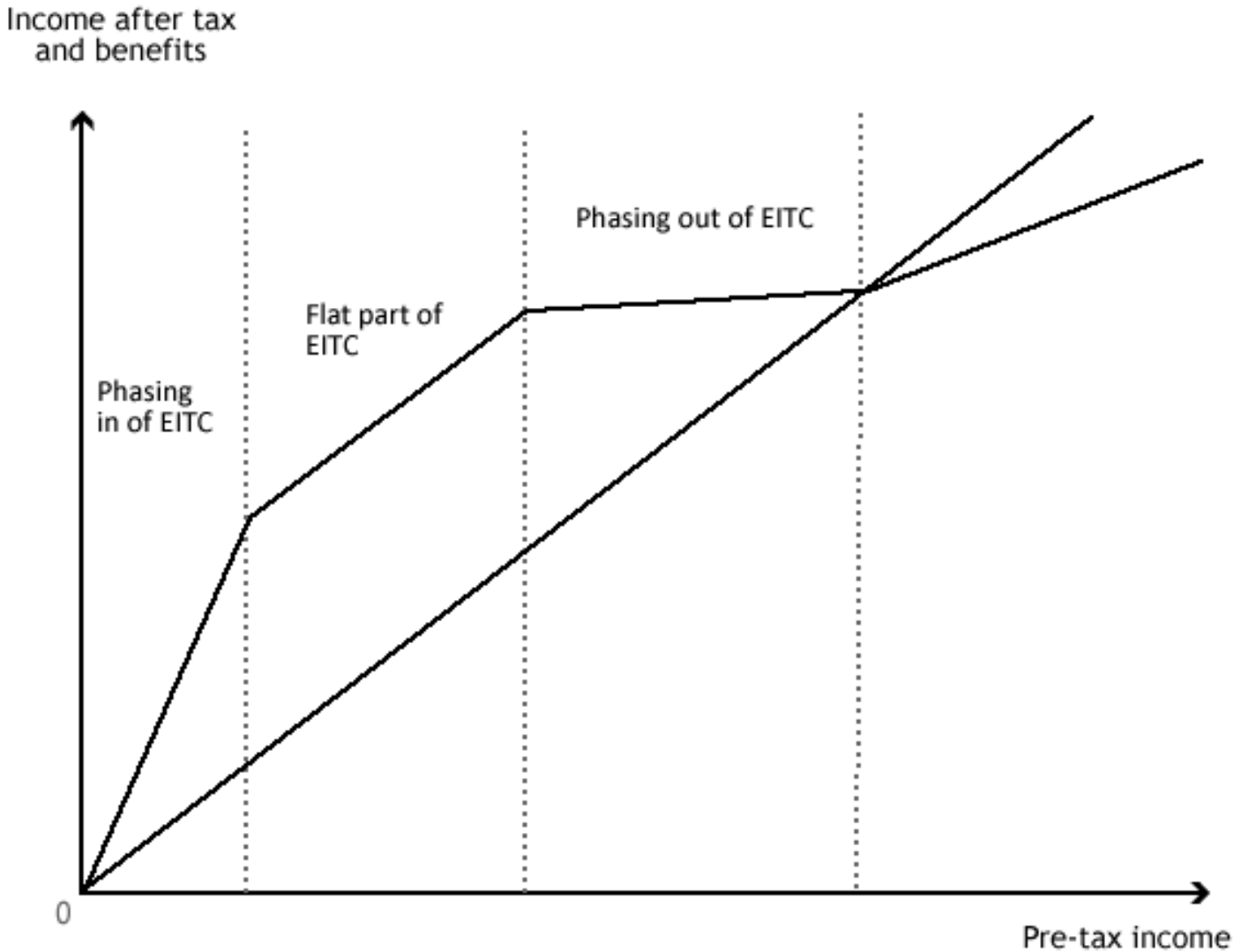
- **Three components**
  1. An increasing subsidy part (40% per dollar of wage top-up)
  2. A constant amount (no tax)
  3. Then a taper rate of 21% as benefits are withdrawn with increasing income

The EITC in the US

Figure 58 – EITC schedule in 2016



The EITC in the US



Impact evaluation of EITC

- **Impact on labour supply**
  - Large empirical literature (Nichols and Rothstein, 2016)
  - Consistent positive employment effects for single mothers

    i.e., \$1000 increase in EITC leads to 6-7 pp increase in employment
  - Evidence of small intensive margin effects (e.g., clustering at the kink)

  $\Rightarrow$ Relatively successful redistribution programme

- **Flaws of the programme**
  - Low amount to the childless
  - Little increase with more than two children
  - Marriage penalty, complexity

Eissa and Liebman (QJE, 1996)

- **First study on EITC**
  - Early DiD approach
  - Compare single mothers (treated) with single women without kids
  - Exploit the 1987 increase in EITC (TRA 1986)
  - Use CPS data
- **Results**
  - Positive impact on participation of lone mothers (+1.4-3.7 ppts)
  - No negative effects on married men's labour supply
  - Modest reduction in married women's labour supply

Eissa and Liebman (QJE, 1996)

Table 5 – LFP rates of unmarried women

	pre-TRA86	**Post-TRA86**	**Diff.**	**DiD**
A. With vs. without children				
Women with kids	0.729	0.753	0.024	
	(0.004)	(0.004)	(0.006)	
Women without kids	0.952	0.952	0.000	0.024
	(0.001)	(0.001)	(0.002)	(0.006)
B. Less than high-school – with vs. without children				
Women with kids	0.479	0.497	0.018	
	(0.010)	(0.010)	(0.014)	
Women without kids	0.784	0.761	-0.023	0.041
	(0.010)	(0.009)	(0.013)	(0.019)
C. High-school – with vs. without children				
Women with kids	0.764	0.787	0.023	
	(0.006)	(0.006)	(0.008)	
Women without kids	0.945	0.943	-0.002	0.025
	(0.002)	(0.003)	(0.004)	(0.009)

SOURCE : Eissa and Liebman (1996), Tab. II, p. 617.

Hoynes and Patel (JHR, 2017)

- **Recent study on EITC**
  - Exploit the 1994-95 increase in EITC (OBRA 1993)
  - Use CPS March data
  - DiD + parametrized DiD + event study

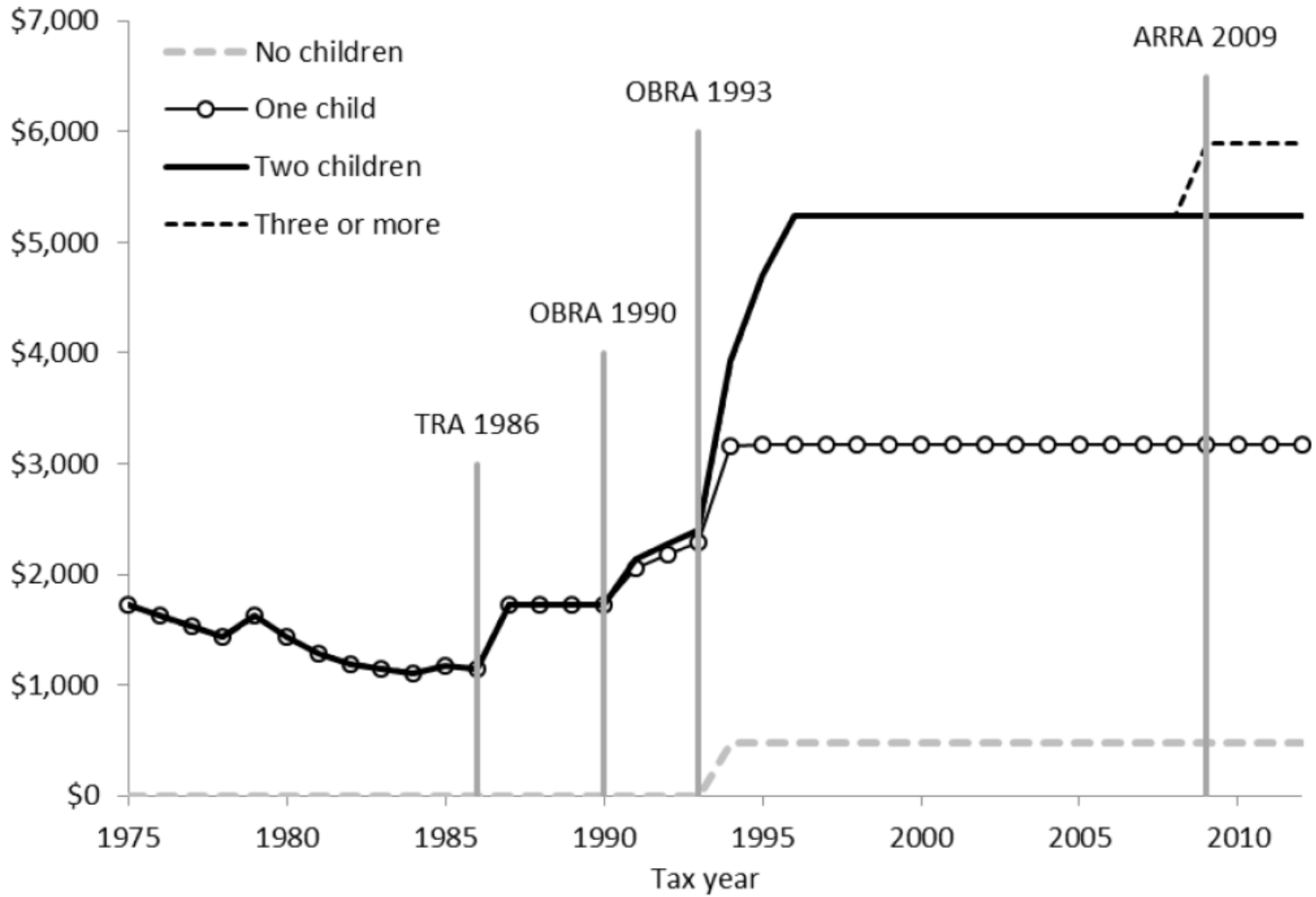
- **Event study approach**
  - Estimating full set of year effets, idem for treated

$$y_{it} = \alpha + \sum_{t_0}^{T} \beta_j [I(t = j) x \text{treat}_c] + \eta_{st} + \gamma_c + \Phi X_{it} + \gamma Z_{cst} + \varepsilon_{it}$$

  - treat_c is dummy for number of children (treatment group)
  - β_j difference between treatment and control in each year j
  - η_{st} state $\times$ year fixed effects
  - Z_{cst} state $\times$ year $\times$ nber children unemployment rates

1993 EITC expansion

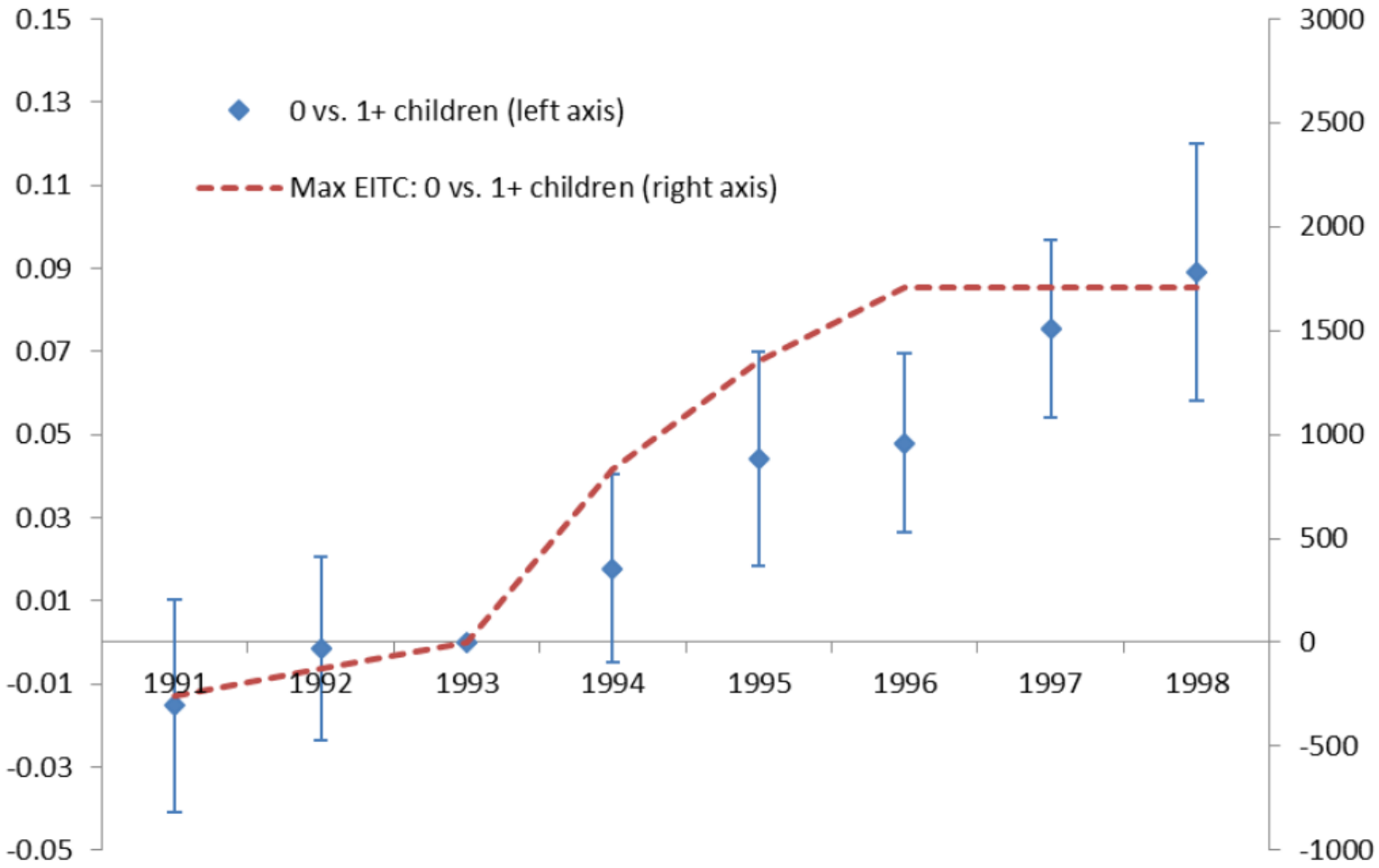
Figure 59 – Maximum benefits by number of children



Source : Hoynes and Patel, 2017

Hoynes and Patel (JHR, 2017)

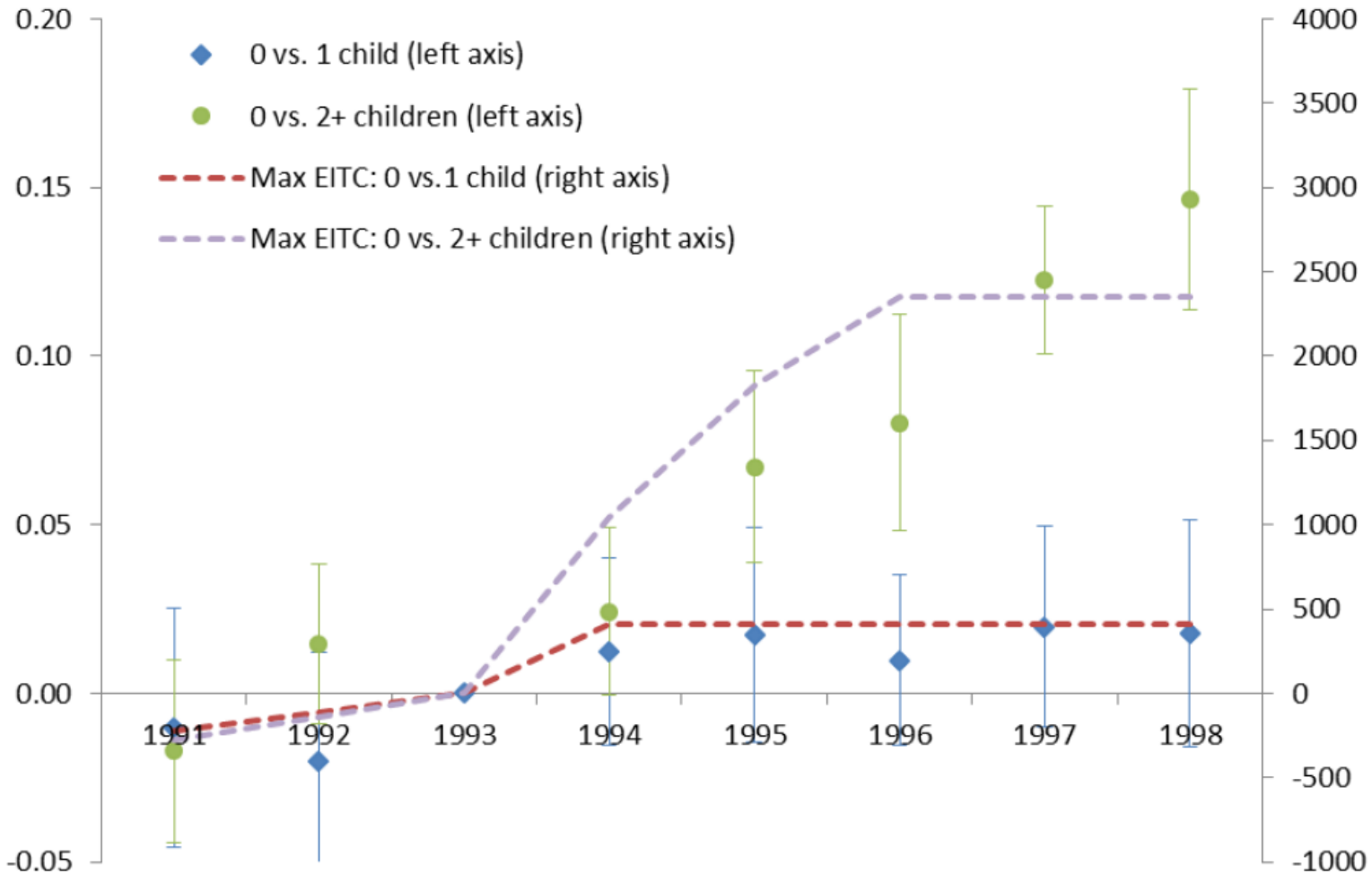
Figure 60 – Estimates of the Effects of OBRA1993 on Employment



SOURCE : Hoynes and Patel (2017), Fig. 6

Hoynes and Patel (JHR, 2017)

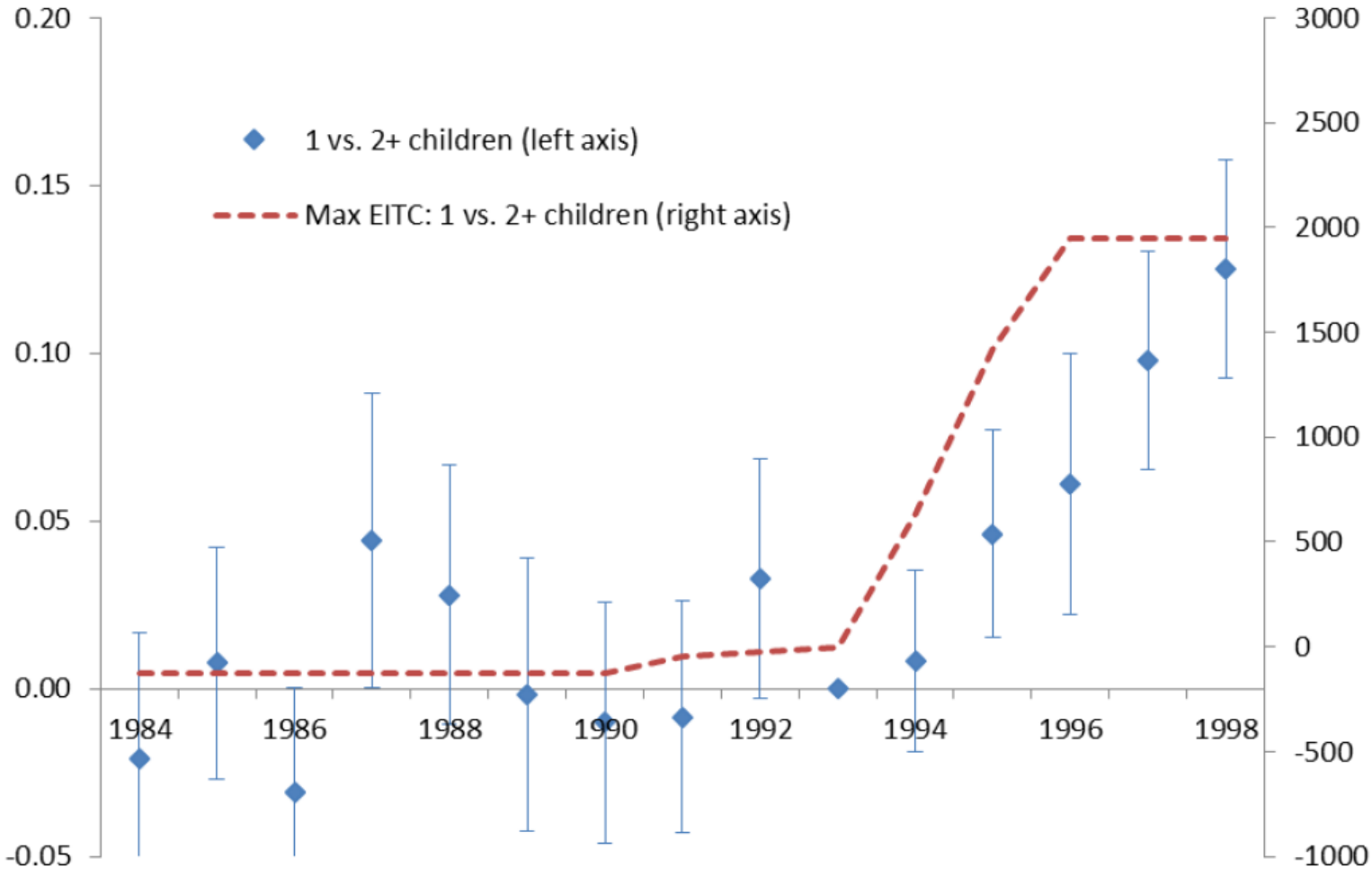
Figure 61 – Estimates of the Effects of OBRA1993 on Employment



SOURCE : Hoynes and Patel (2017), Fig. 7

Hoynes and Patel (JHR, 2017)

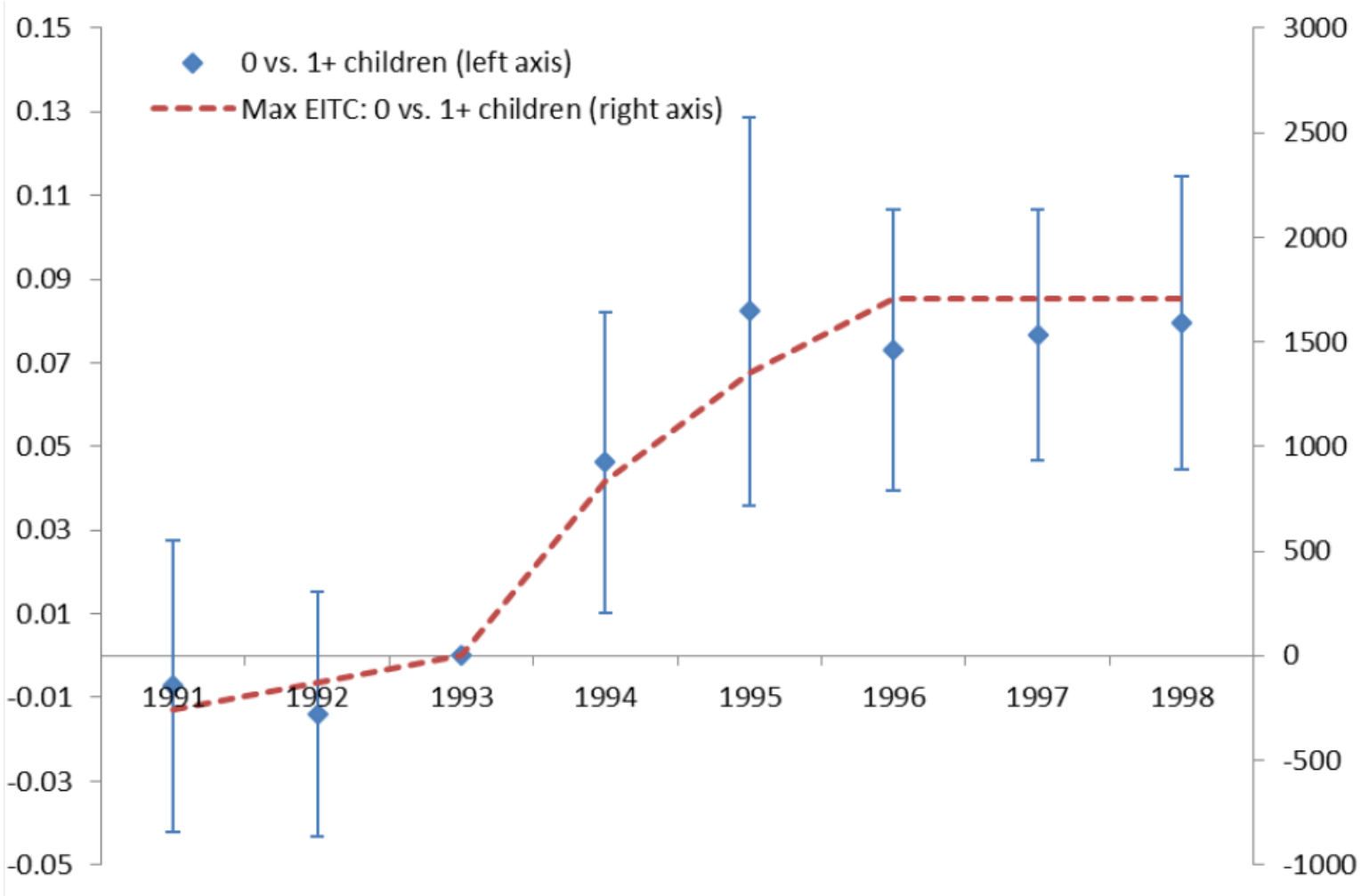
Figure 62 – Estimates of the Effects of OBRA1993 on Employment



SOURCE : Hoynes and Patel (2017), Fig. 8

Hoynes and Patel (JHR, 2017)

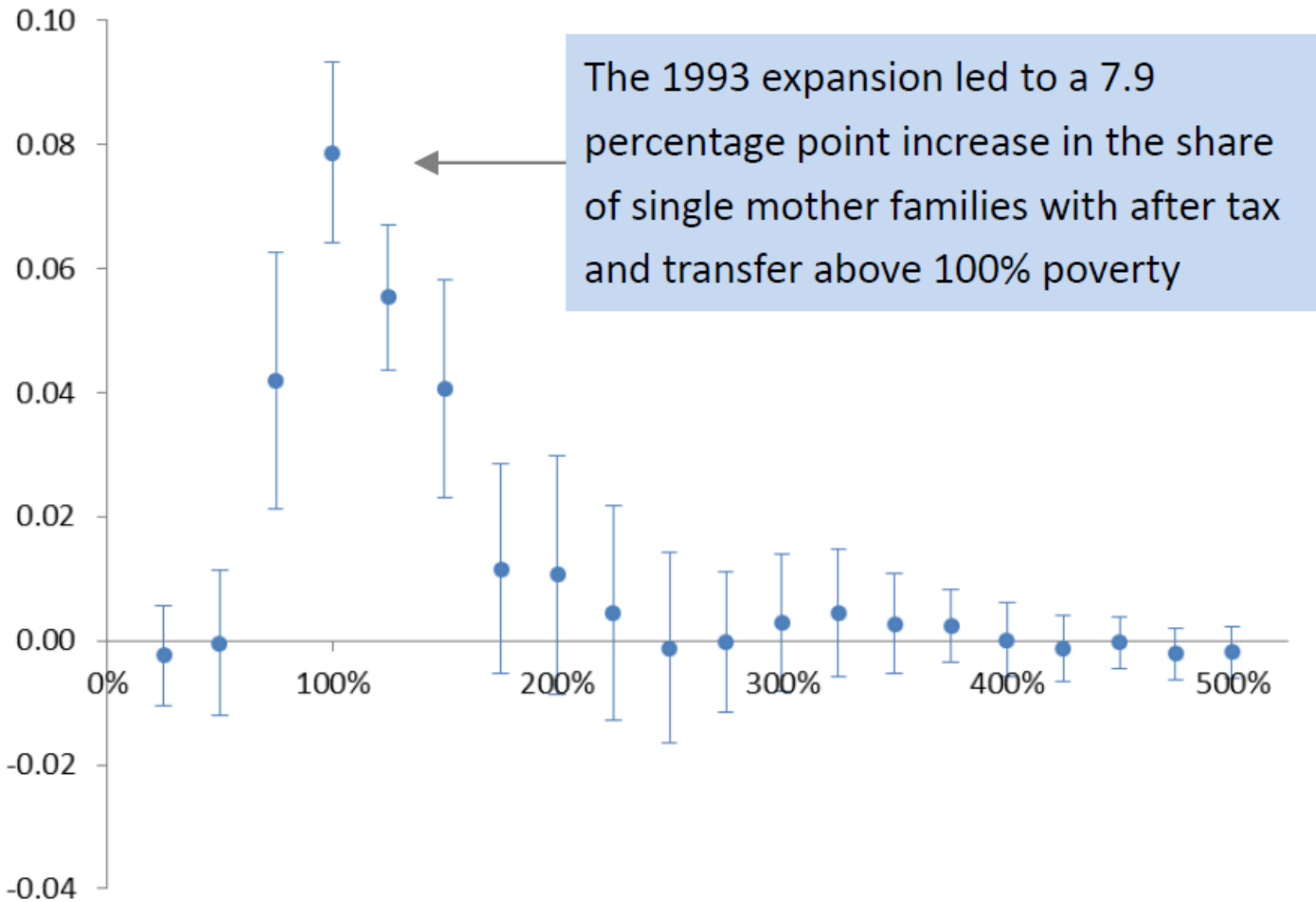
Figure 63 – Estimates of the Effects of OBRA1993 on Poverty (above 100% of Poverty Threshold)



Source : Hoynes and Patel (2017).

Hoynes and Patel (JHR, 2017)

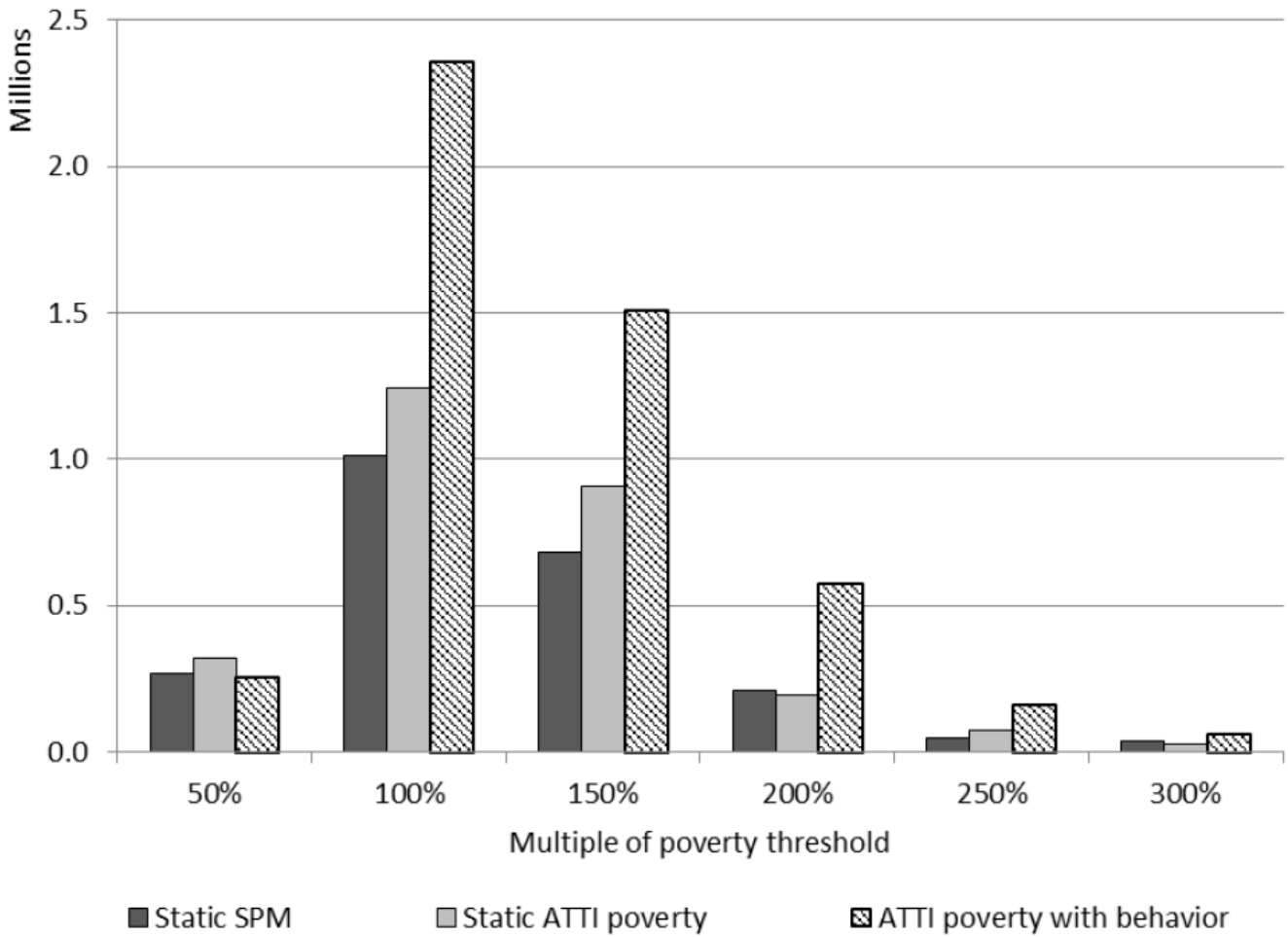
Figure 64 – Estimates of the Effects of OBRA1993 on Income above poverty level



Source : Hoynes and Patel (2017).

Hoynes and Patel (JHR, 2017)

Figure 65 – Simulated number of children raised above income-to-poverty cutoffs



Source : Hoynes and Patel (2017).

Hoynes and Patel (JHR, 2017)

- **Results**
  - $1000 increase in policy-induced increase in the EITC leads to a 5.6-7.8 percentage point increase in employment for single mothers
  - Extensive margin elasticities range from 0.32-0.45
  - Ignoring the behavioural response leads to an underestimate of the anti-poverty effects by 50 percent

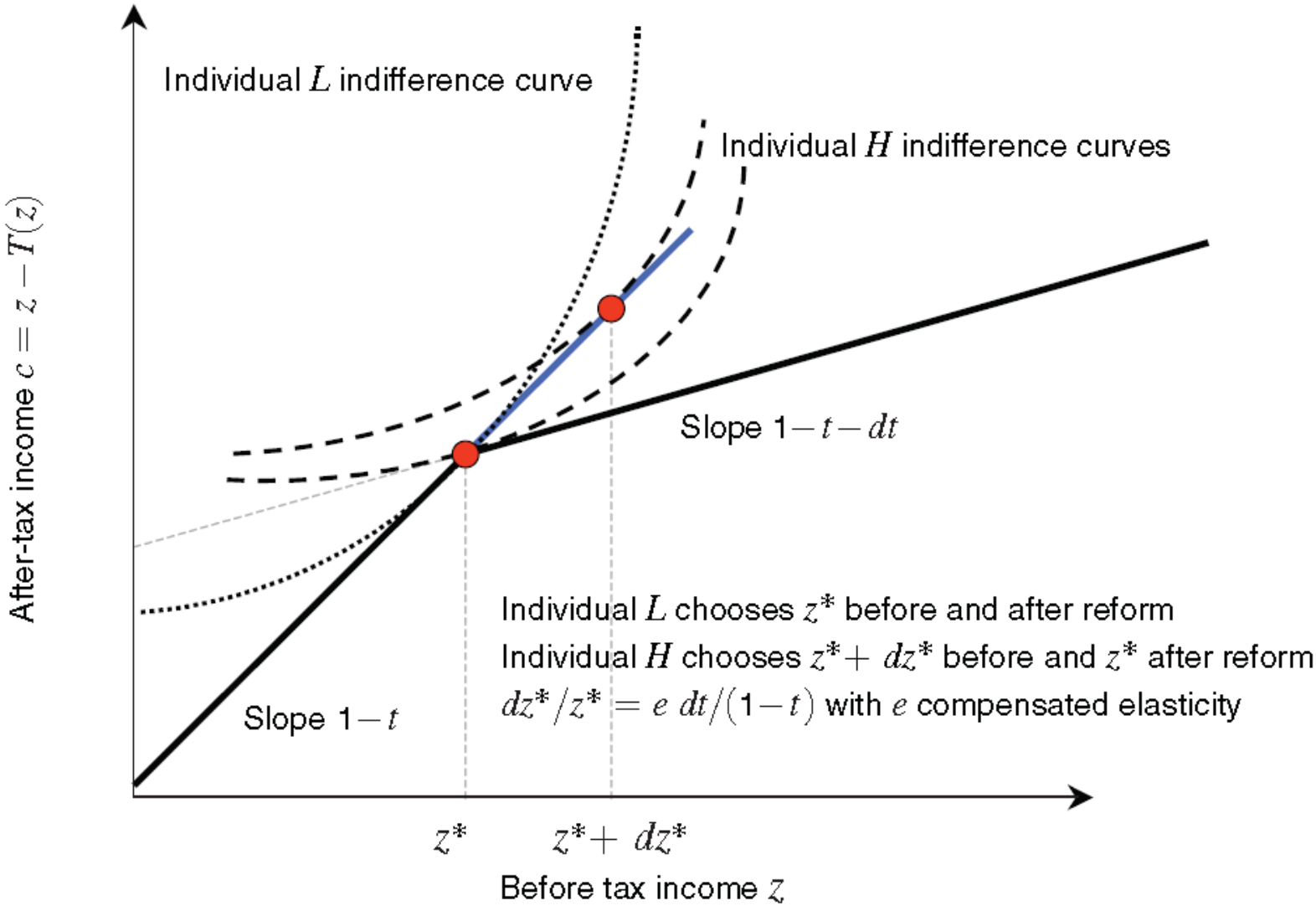
Bunching at kinks

- **Saez (AEJ-EP, 2010)**
  - Key prediction of standard labour supply model : individuals should bunch at (convex) kink points of the budget set
  - Amount of bunching at kinks provides non-parametric estimates of intensive elasticity

- **Formula for elasticity**

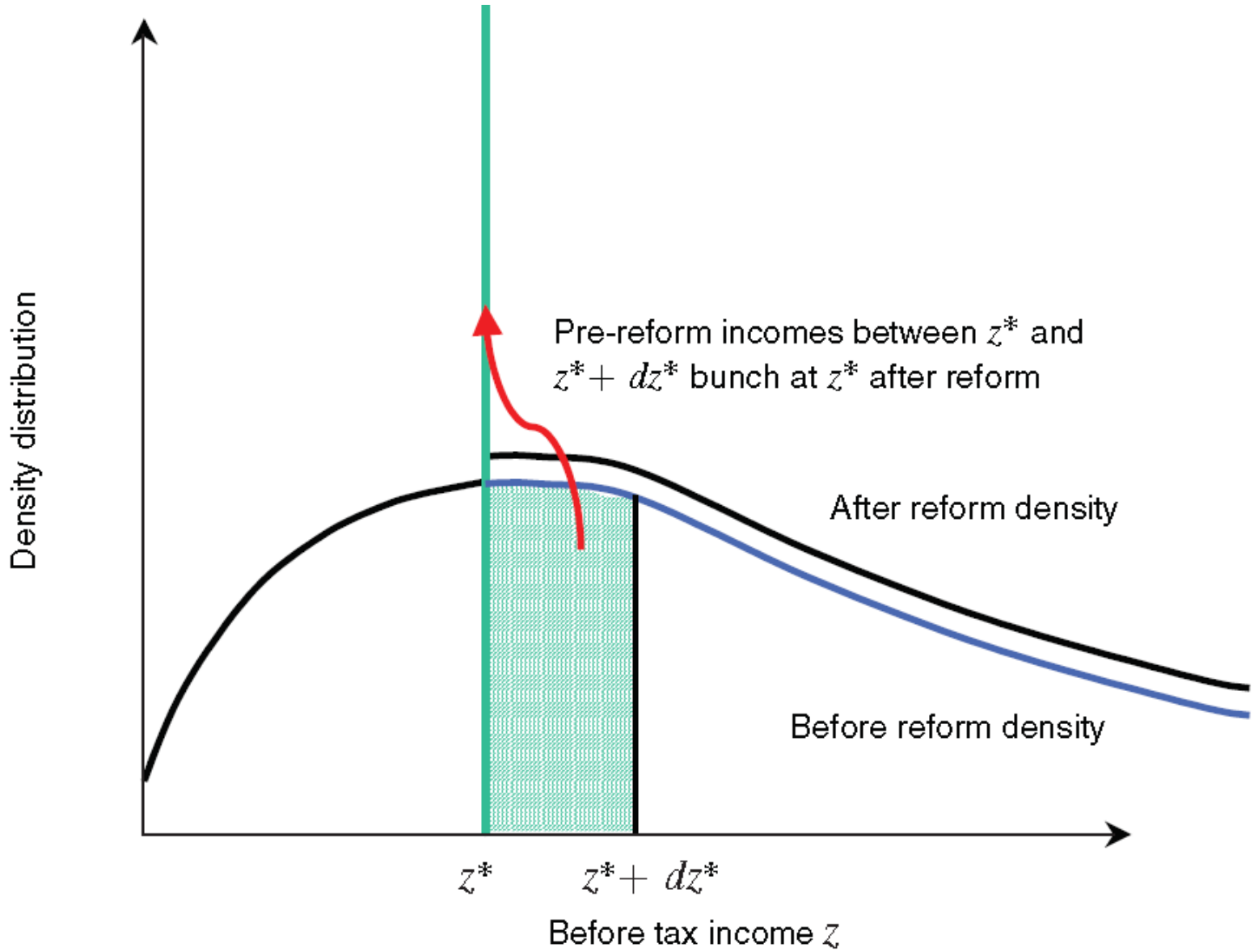
$$\varepsilon^c = \frac{dz/z}{dt/(1-t)} = \frac{\text{excess mass at kink}}{\% \text{ change in net of tax rate}}$$

Figure 66 – Indifference curves and bunching



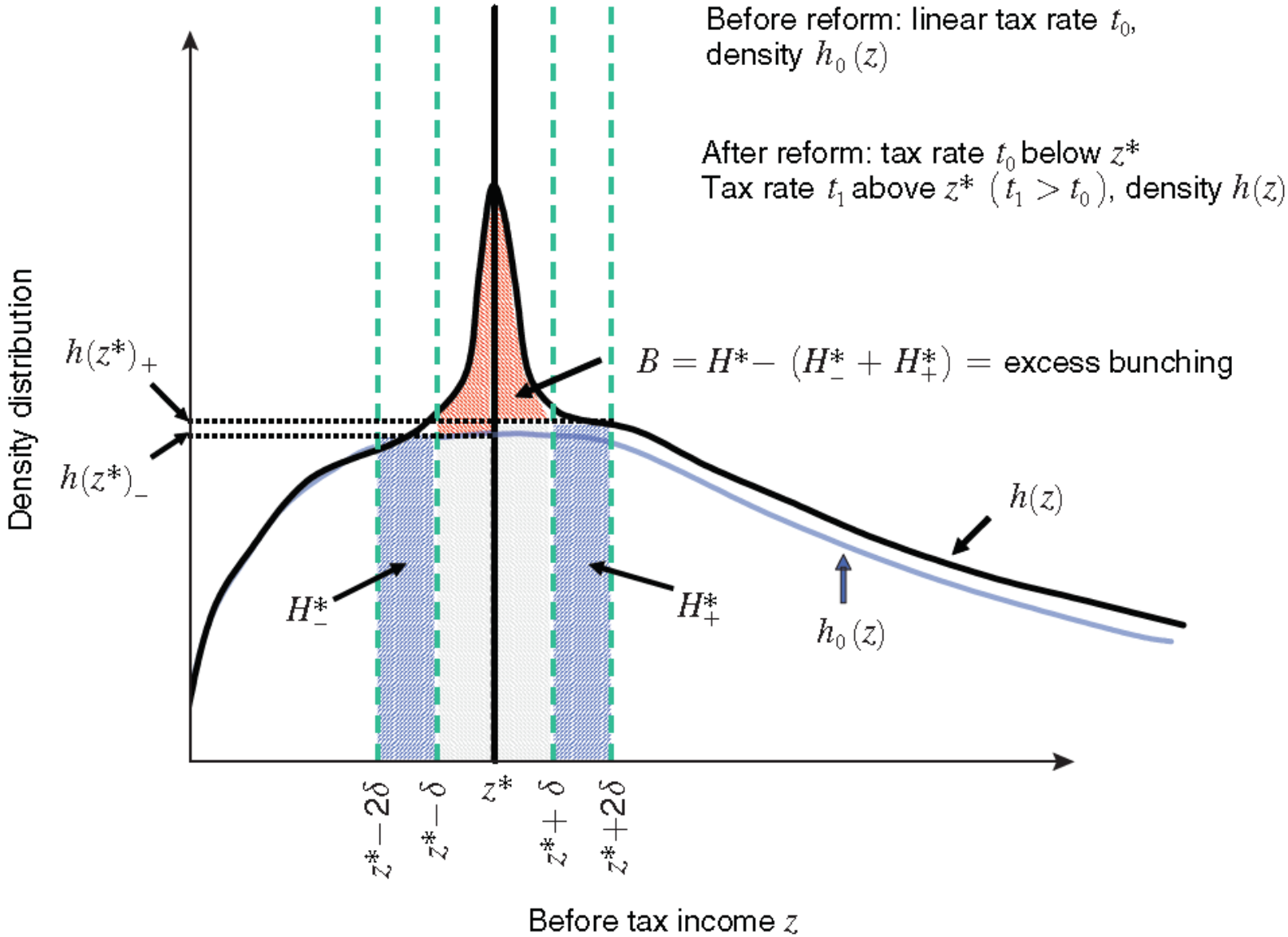
Source : Saez (2010), Fig. 1.A.

Figure 67 – Density distributions and bunching



Source : Saez (2010), Fig. 1.B.

Figure 68 – Estimating excess bunching using empirical densities

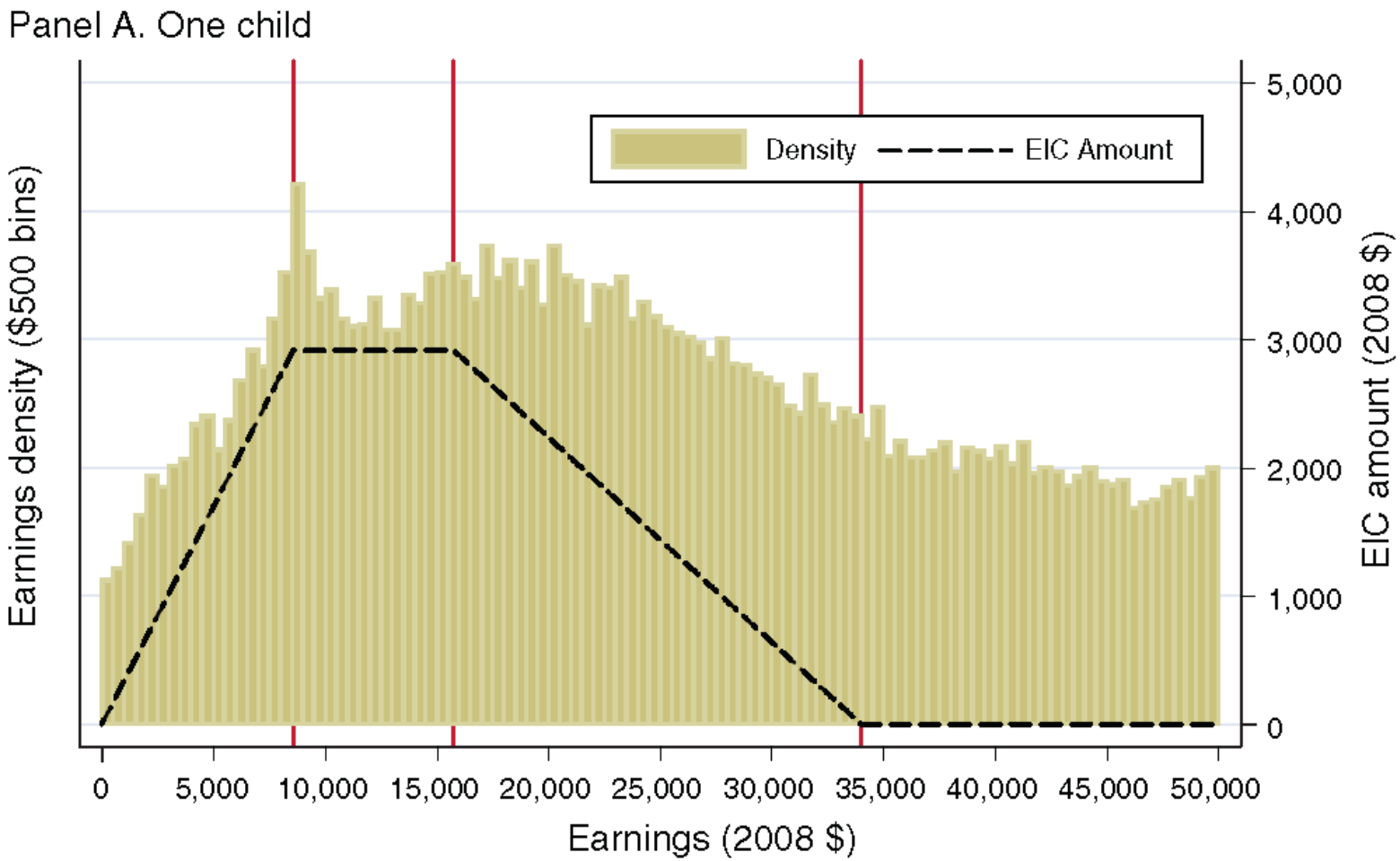


SOURCE : Saez (2010), Fig. 2

Saez (AEJ-EP, 2010)

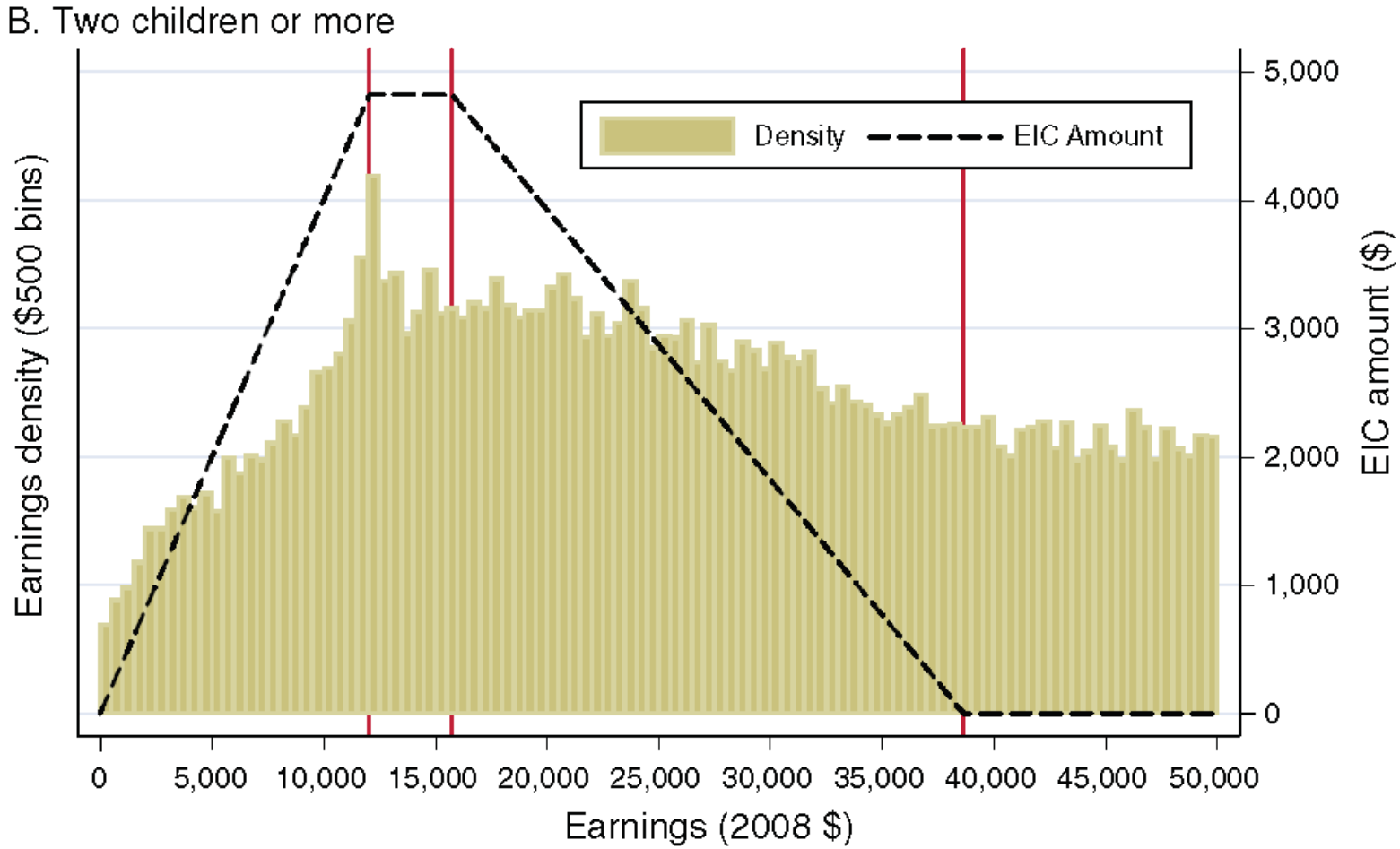
- **Some evidence of bunching at EITC**
  - Evidence of bunching at first kink point of EITC
    $\Rightarrow$ implied elasticity of 0.25
- **Mechanisms for bunching**
  - Self-employment income for EITC

Figure 69 – Earnings density distribution and EITC



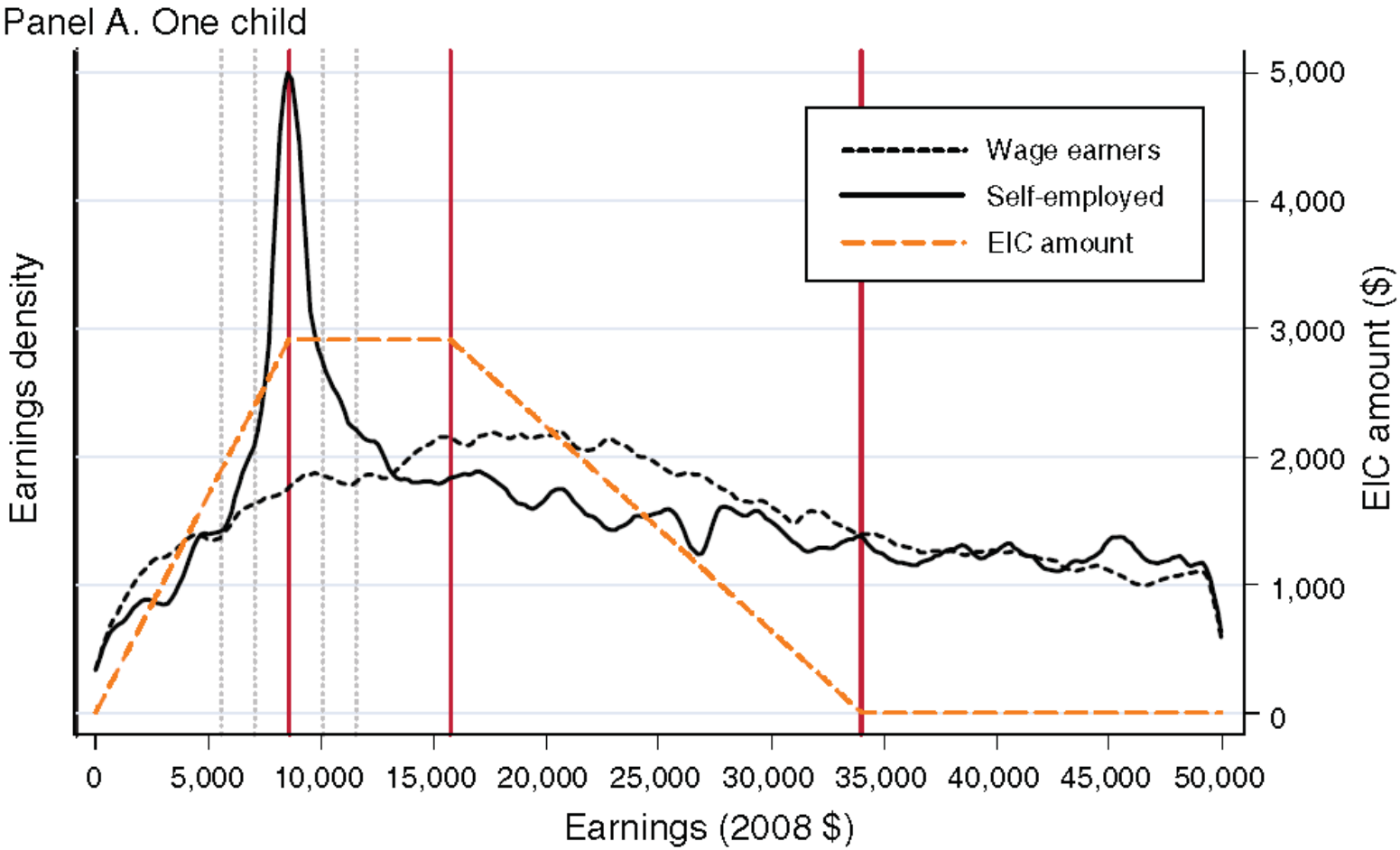
SOURCE : Saez (2010), Fig. 3.A.

Figure 70 – Earnings density distribution and EITC



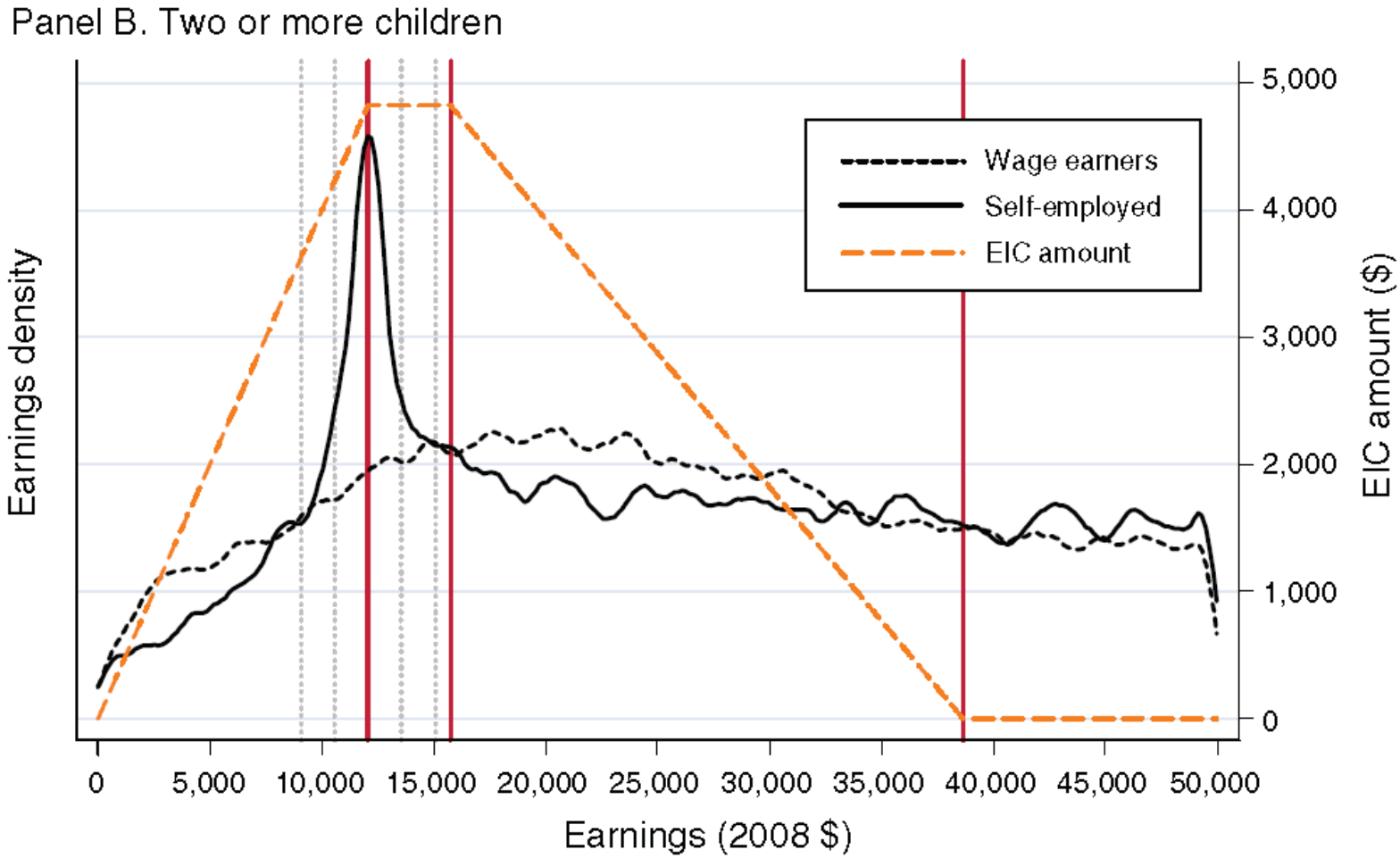
Source : Saez (2010), Fig. 3.B.

Figure 71 – Earnings density distribution : wage earners vs self-employed



SOURCE : Saez (2010), Fig. 4.A.

Figure 72 – Earnings density distribution : wage earners vs self-employed

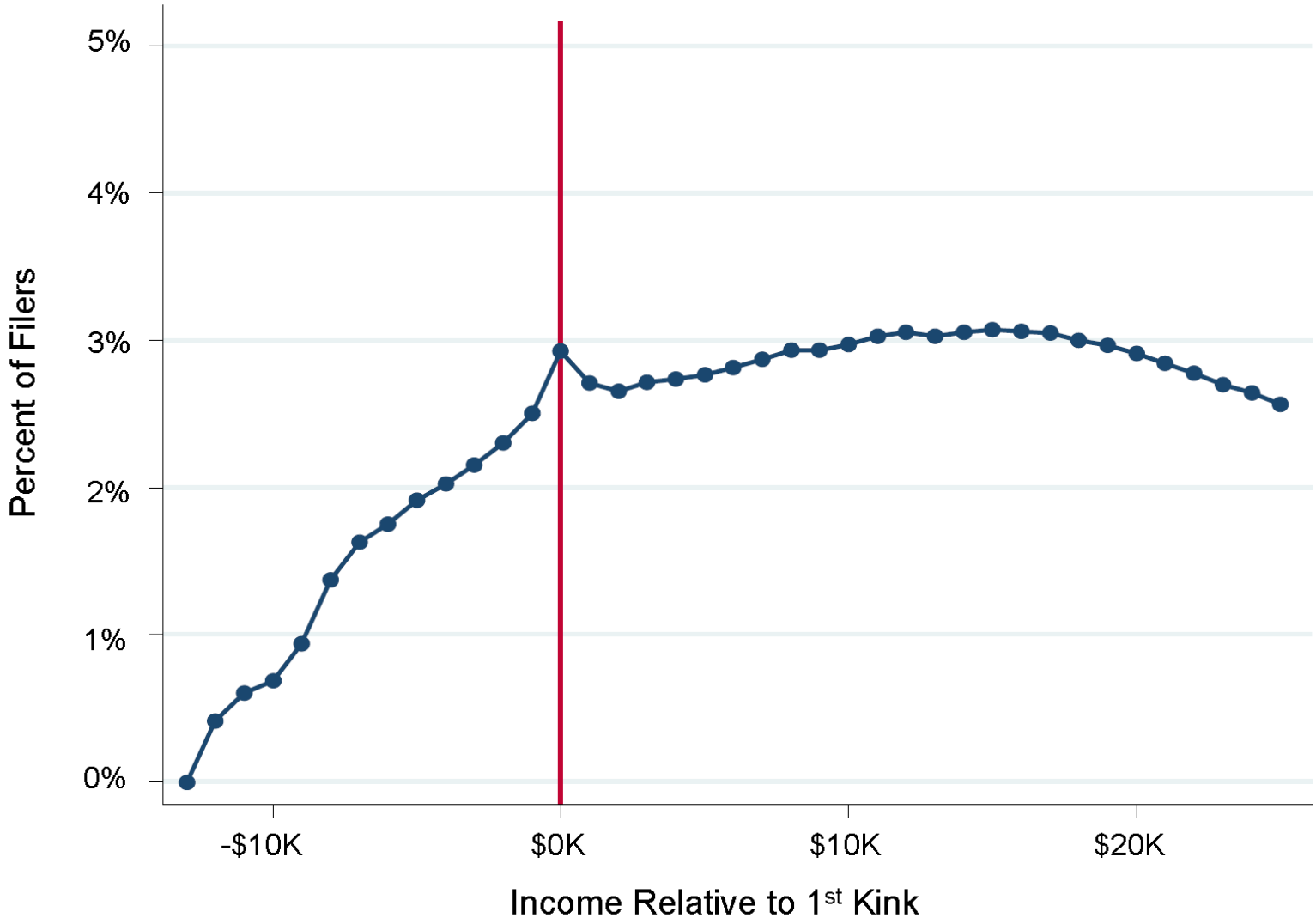


Source : Saez (2010), Fig. 4.B.

Chetty, Friedman, Saez (AER, 2013)

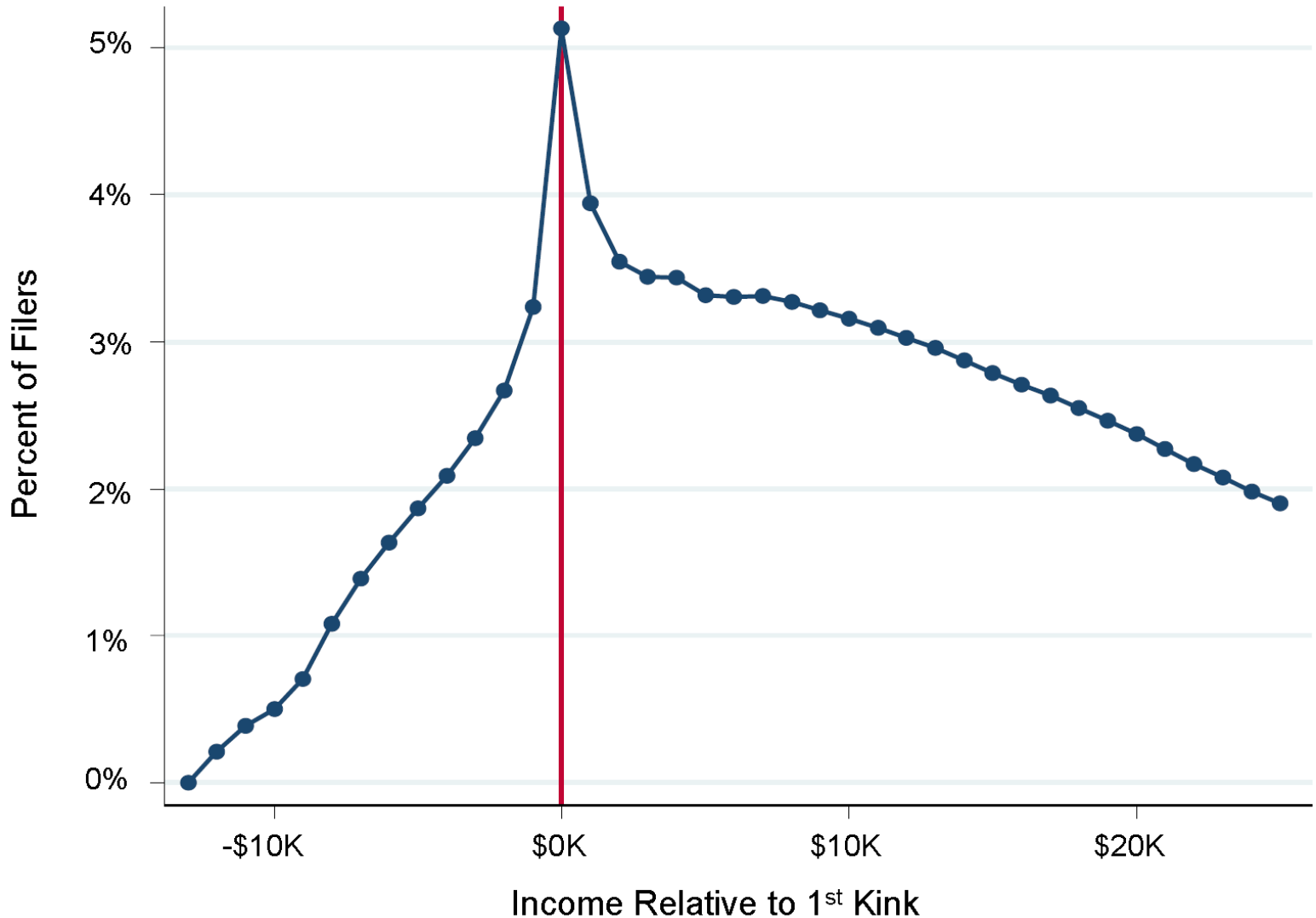
- **Exploit heterogeneous information about EITC**
  - Use U.S. population wide tax return data 1996-2009
  - Measure heterogeneity in bunching of self-employed across 3-digit zip codes
  - Idea is to proxy for local information with bunching
- **Main empirical approaches**
  - Estimate impact on earnings of moving to high bunching area
  - Estimate impact on earnings of child birth in high bunching area compared to low bunching area
  - Identification using low bunching area as counterfactual

Figure 73 – Earnings distribution in Kansas



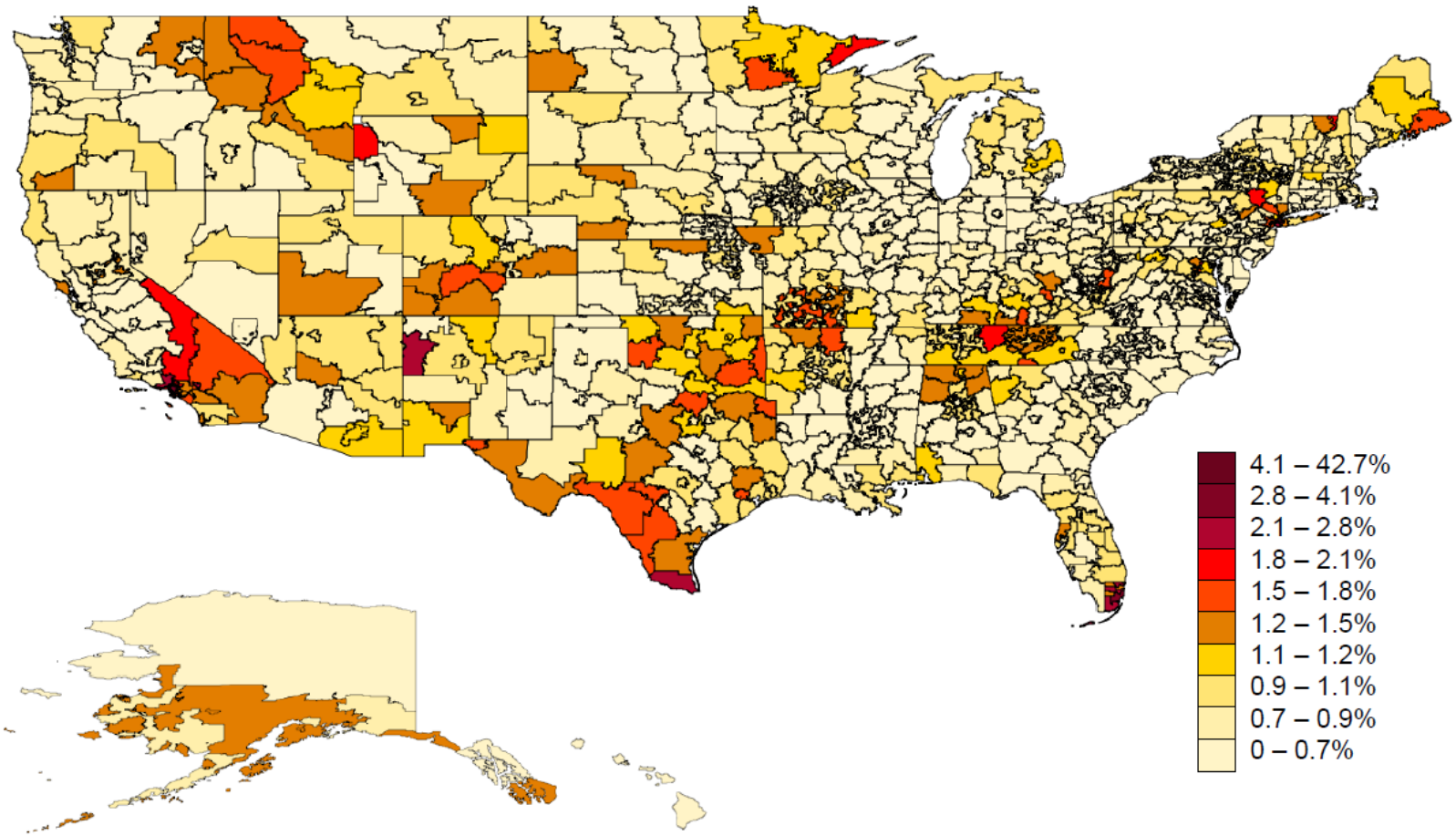
SOURCE : Chetty, Friedman and Saez (2013).

Figure 74 – Earnings distribution in Texas



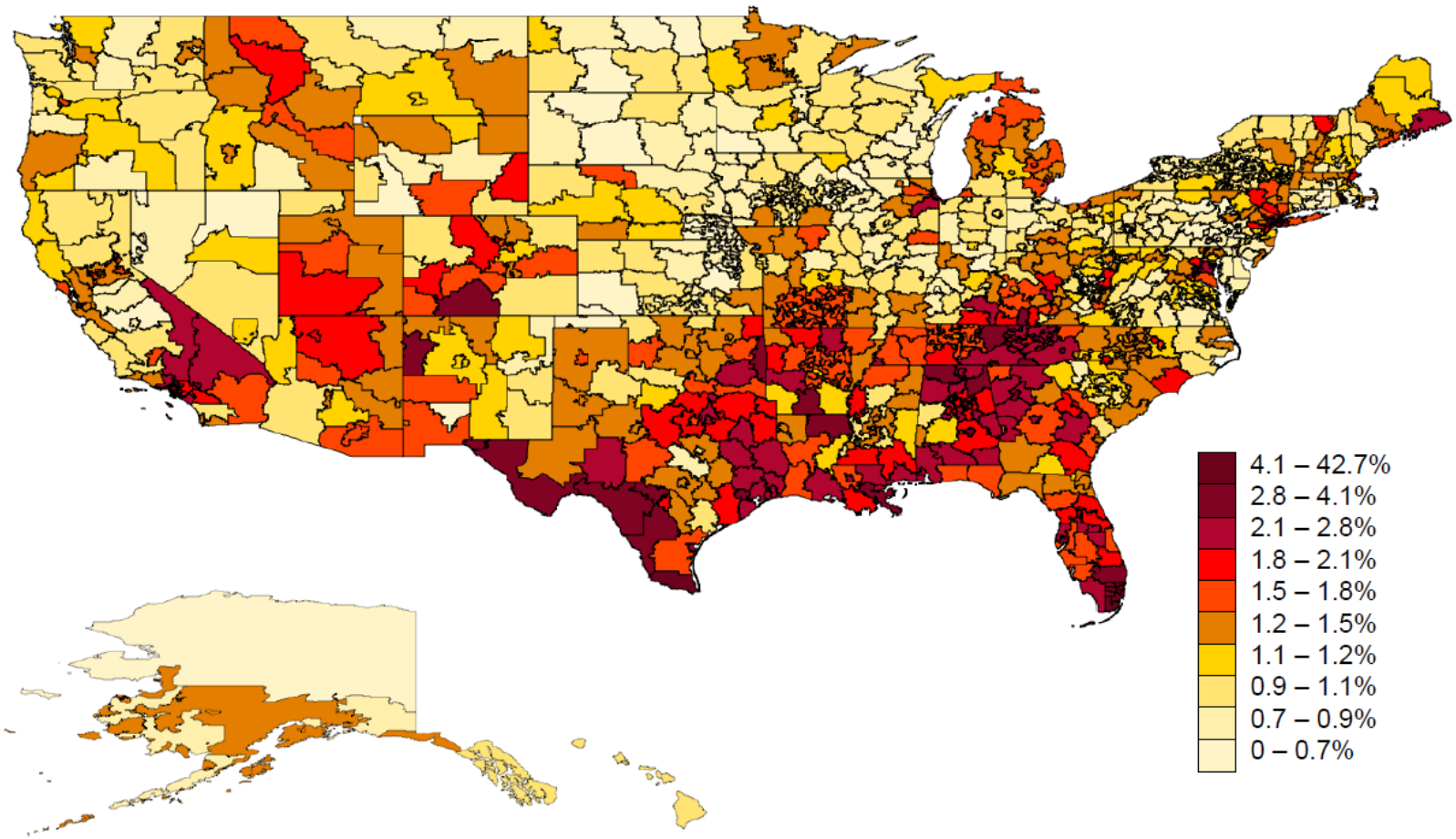
SOURCE : Chetty, Friedman and Saez (2013).

Figure 75 – Fraction of Tax Filers Who Report SE Income that Maximizes EITC Refund in 1996



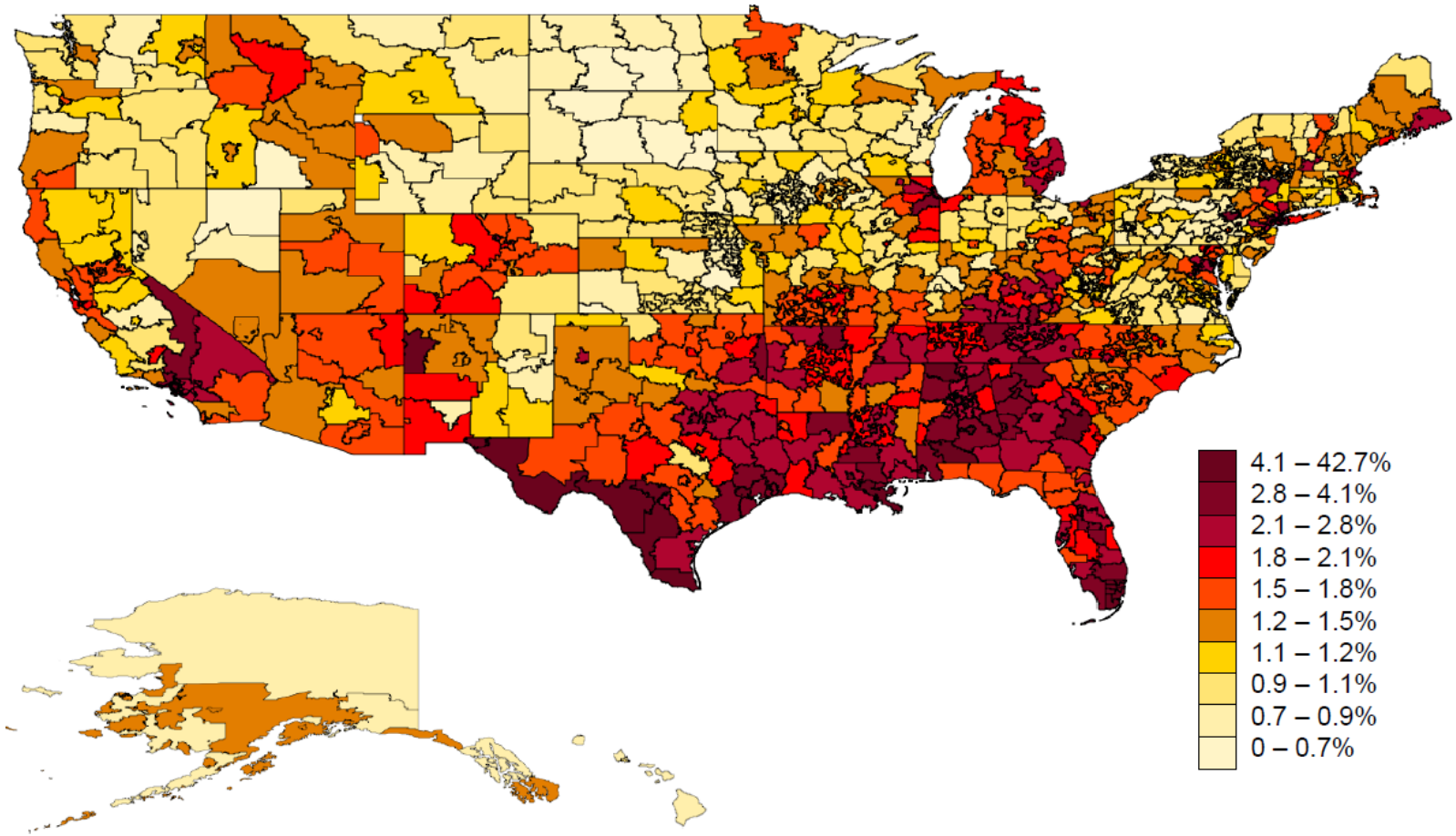
SOURCE : Chetty, Friedman and Saez (2013).

Figure 76 – Fraction of Tax Filers Who Report SE Income that Maximizes EITC Refund in 2002



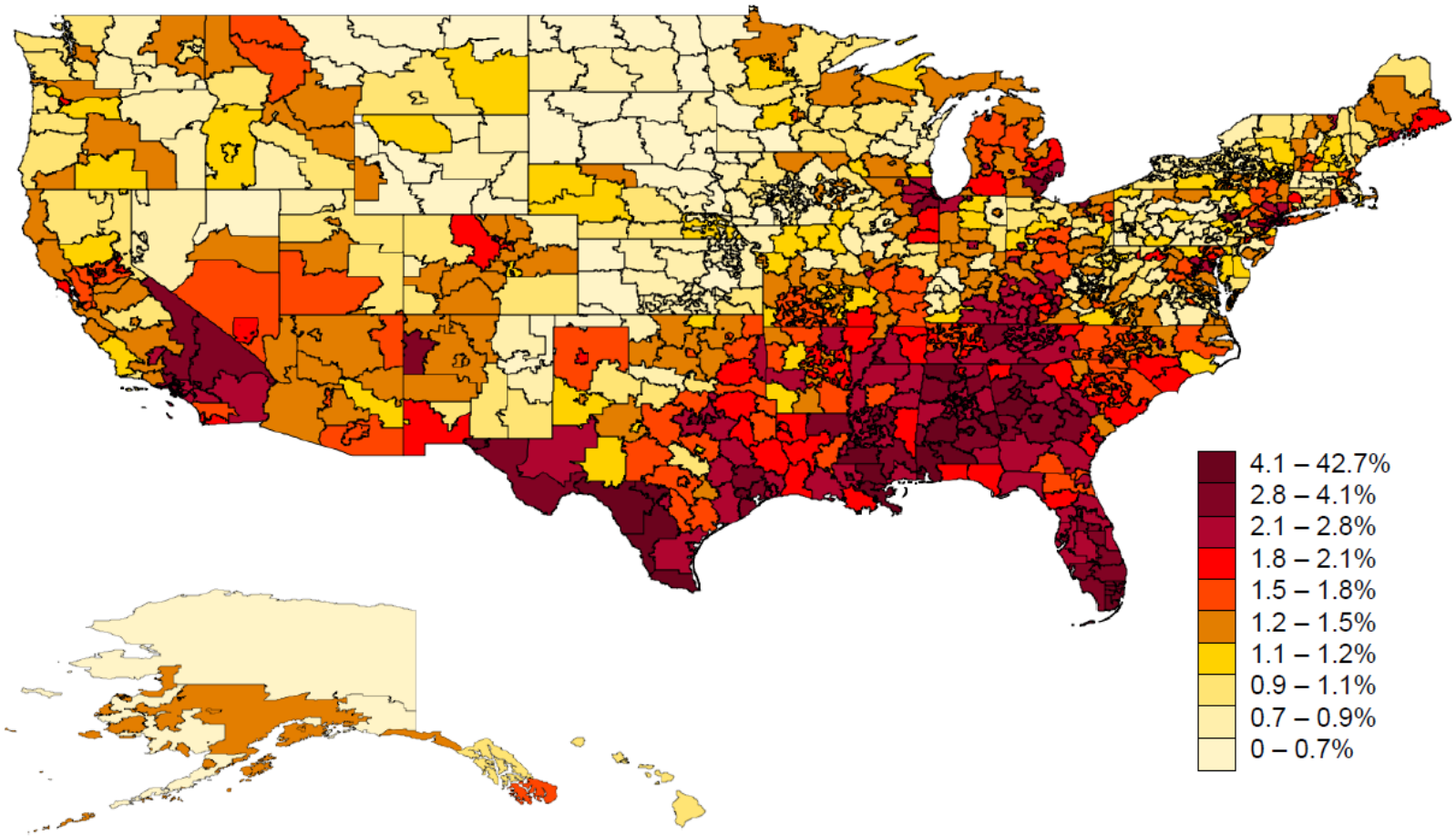
SOURCE : Chetty, Friedman and Saez (2013).

Figure 77 – Fraction of Tax Filers Who Report SE Income that Maximizes EITC Refund in 2005



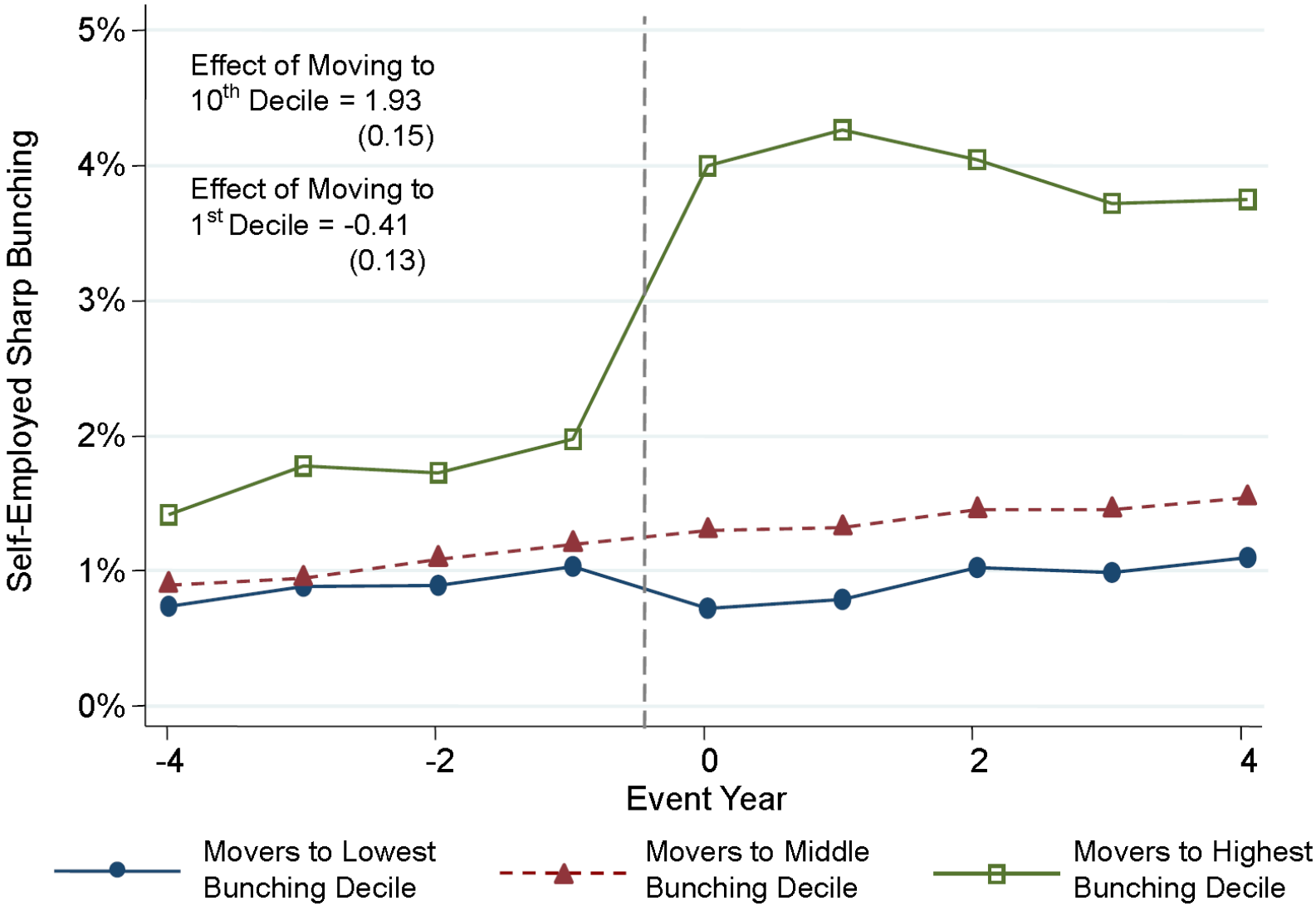
SOURCE : Chetty, Friedman and Saez (2013).

Figure 78 – Fraction of Tax Filers Who Report SE Income that Maximizes EITC Refund in 2008



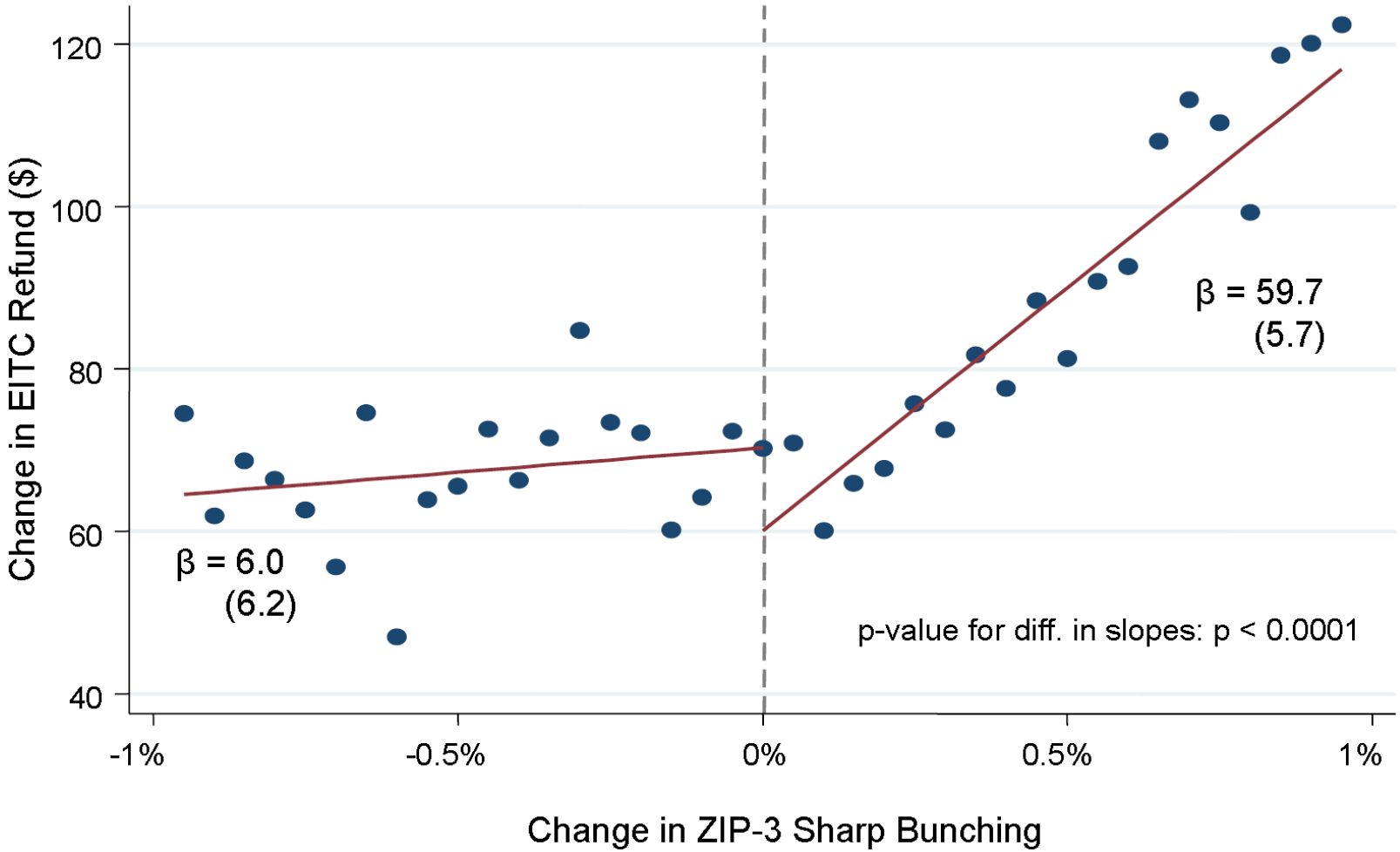
SOURCE : Chetty, Friedman and Saez (2013).

Figure 79 – Event Study of Sharp Bunching Around Moves



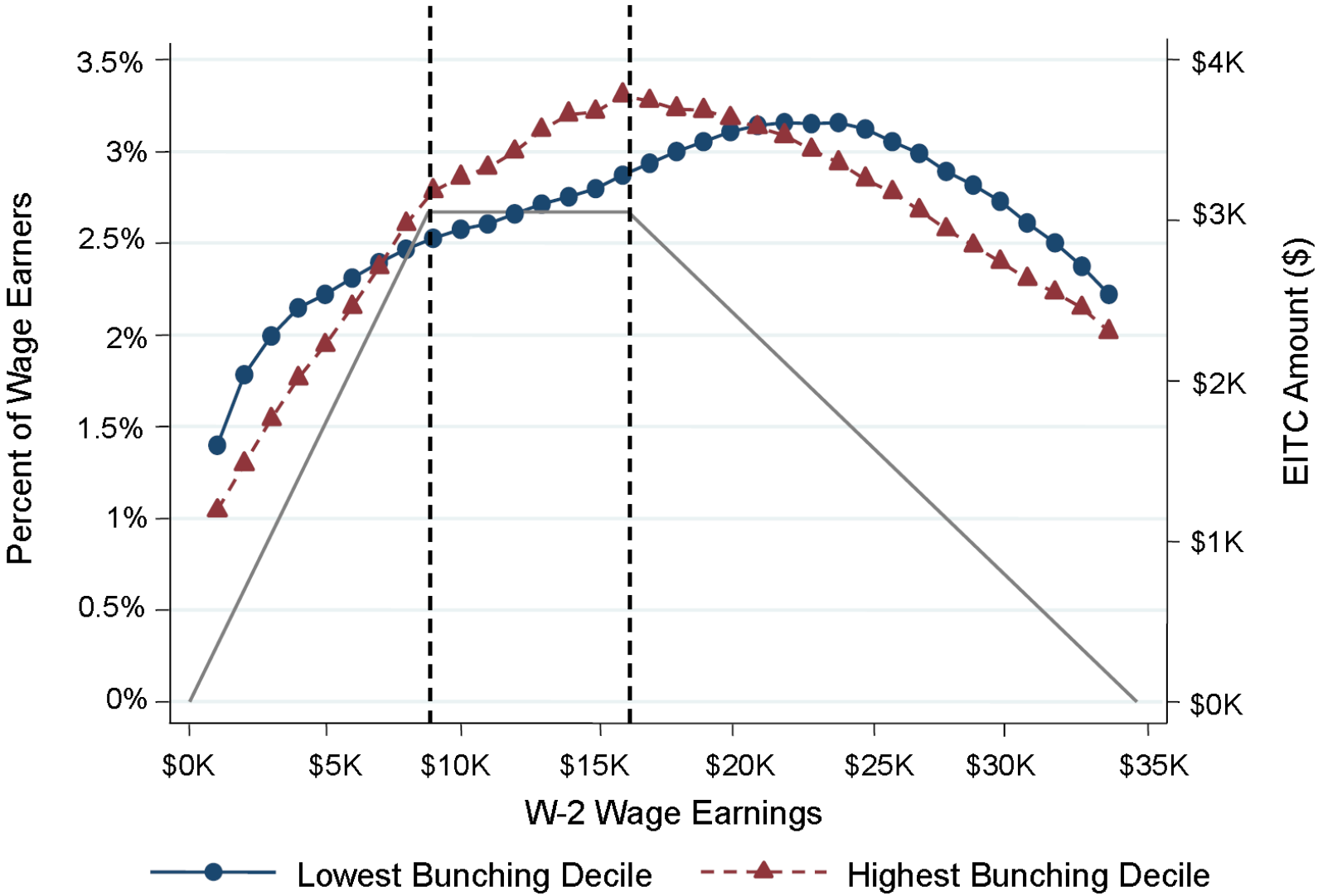
SOURCE : Chetty, Friedman and Saez (2013).

Figure 80 – Change in EITC Refunds vs. Change in Sharp Bunching for Movers



Source : Chetty, Friedman and Saez (2013).

Figure 81 – Income Distribution For Single Wage Earners with One Child High vs. Low Bunching Areas



Source : Chetty, Friedman and Saez (2013).

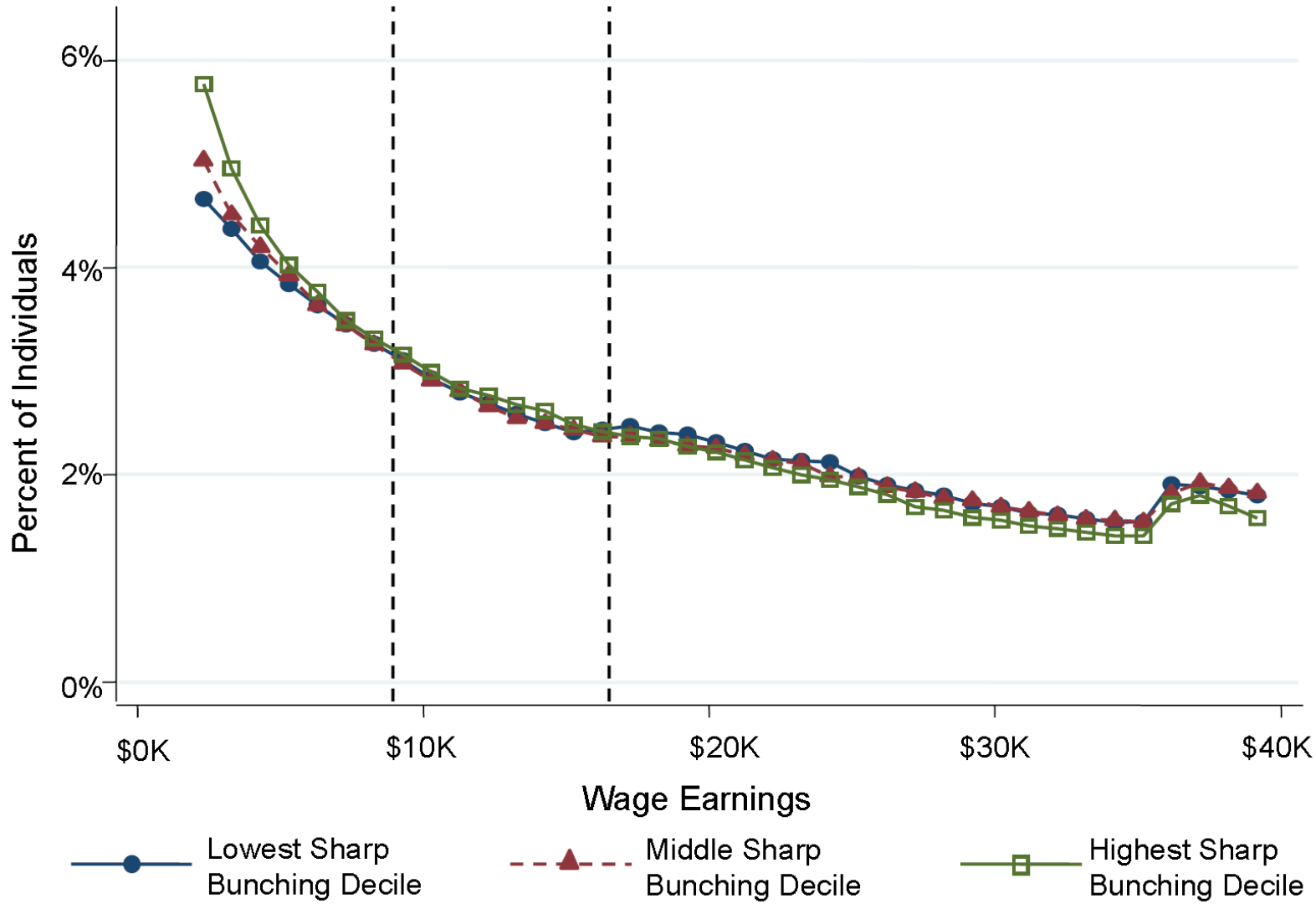
Figure 82 – Difference in Wage Earnings Distributions Between Top and Bunching Decile Wage Earners with One Child

Source : Chetty, Friedman and Saez (2013).

Figure 83 – Difference in Wage Earnings Distributions Between Top and Bunching Decile Wage Earners with One Child

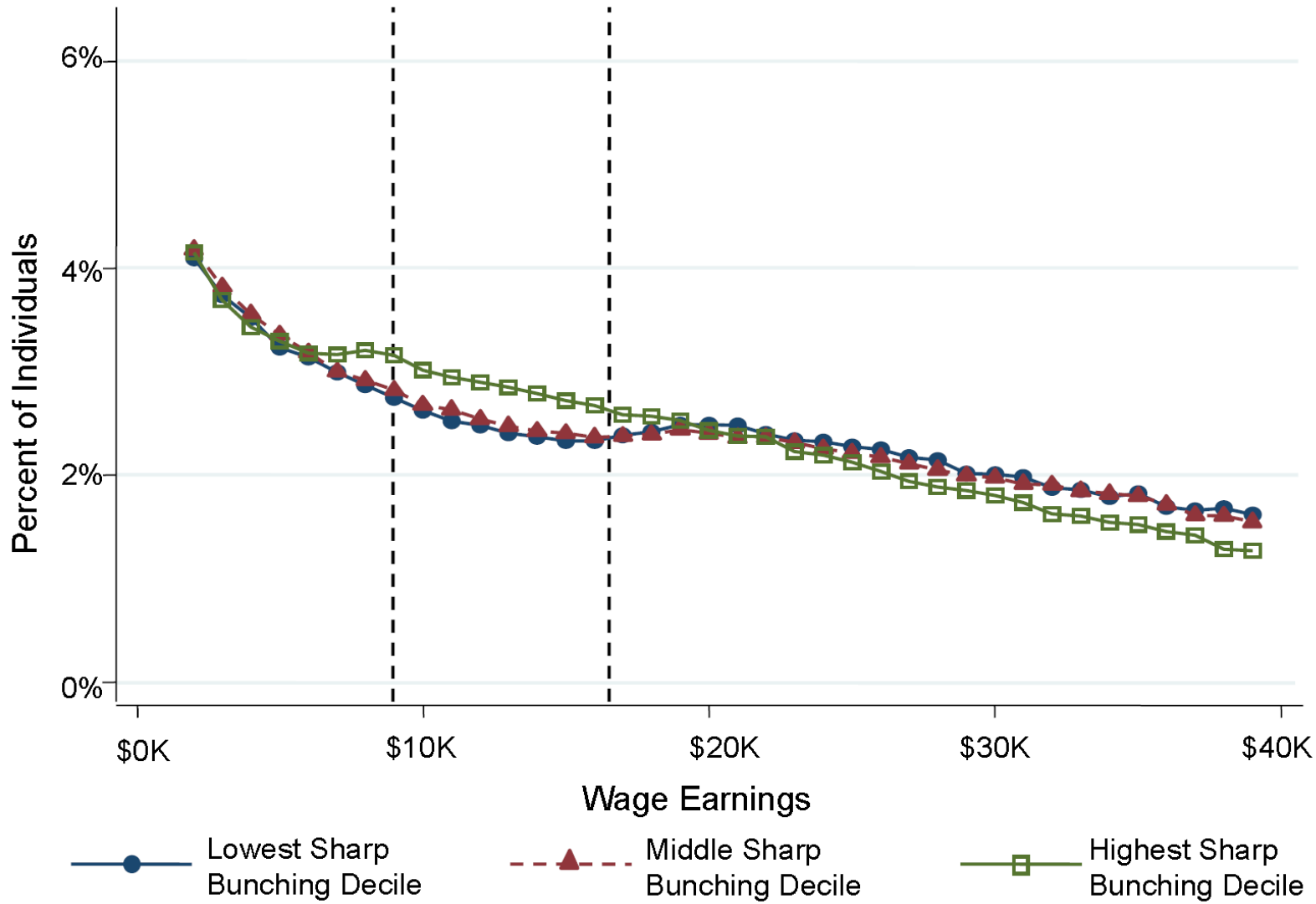
Source : Chetty, Friedman and Saez (2013).

Figure 84 – Earnings Distribution in the Year Before First Child Birth for Wage Earners



Source : Chetty, Friedman and Saez (2013).

Figure 85 – Earnings Distribution in the Year of First Child Birth for Wage Earners



Source : Chetty, Friedman and Saez (2013).

Chetty, Friedman, Saez (AER, 2013)

Table 6 – Elasticity Estimates Based on Change in EITC Refunds Around Birth of First Child

	Mean elasticity	**Phase-in elasticity**	**Phase-out elasticity**	**Extensive elasticity**
A. Wage earnings				
Elasticity in U.S. 2000-05	0.21	0.31	0.14	0.19
	(0.012)	(0.018)	(0.015)	(0.019)
Elasticity in top decile ZIP-3s	0.55	0.84	0.29	0.60
	(0.020)	(0.031)	(0.020)	(0.034)
B. Total earnings (including self-employment income)				
Elasticity in U.S. 2000-05	0.36	0.65	0.36	
	(0.017)	(0.030)	(0.019)	
Elasticity in top decile ZIP-3s	1.06	1.70	0.31	1.06
	(0.029)	(0.047)	(0.010)	(0.040)

SOURCE : Chetty, Friedman and Saez (2013), Tab. 3.

Chetty, Friedman, Saez (AER, 2013)

- **Findings**
  - Places with high self-employment EITC bunching display wage earnings distribution more concentrated around plateau
  - Significant intensive margin effects larger than extensive margin effects

- **Interpretation and question**
  - Extensive margin effect could come from imperfect knowledge about the schedule of EITC (salience effect)
  - Among SE, bunching could be reporting not real economic activity

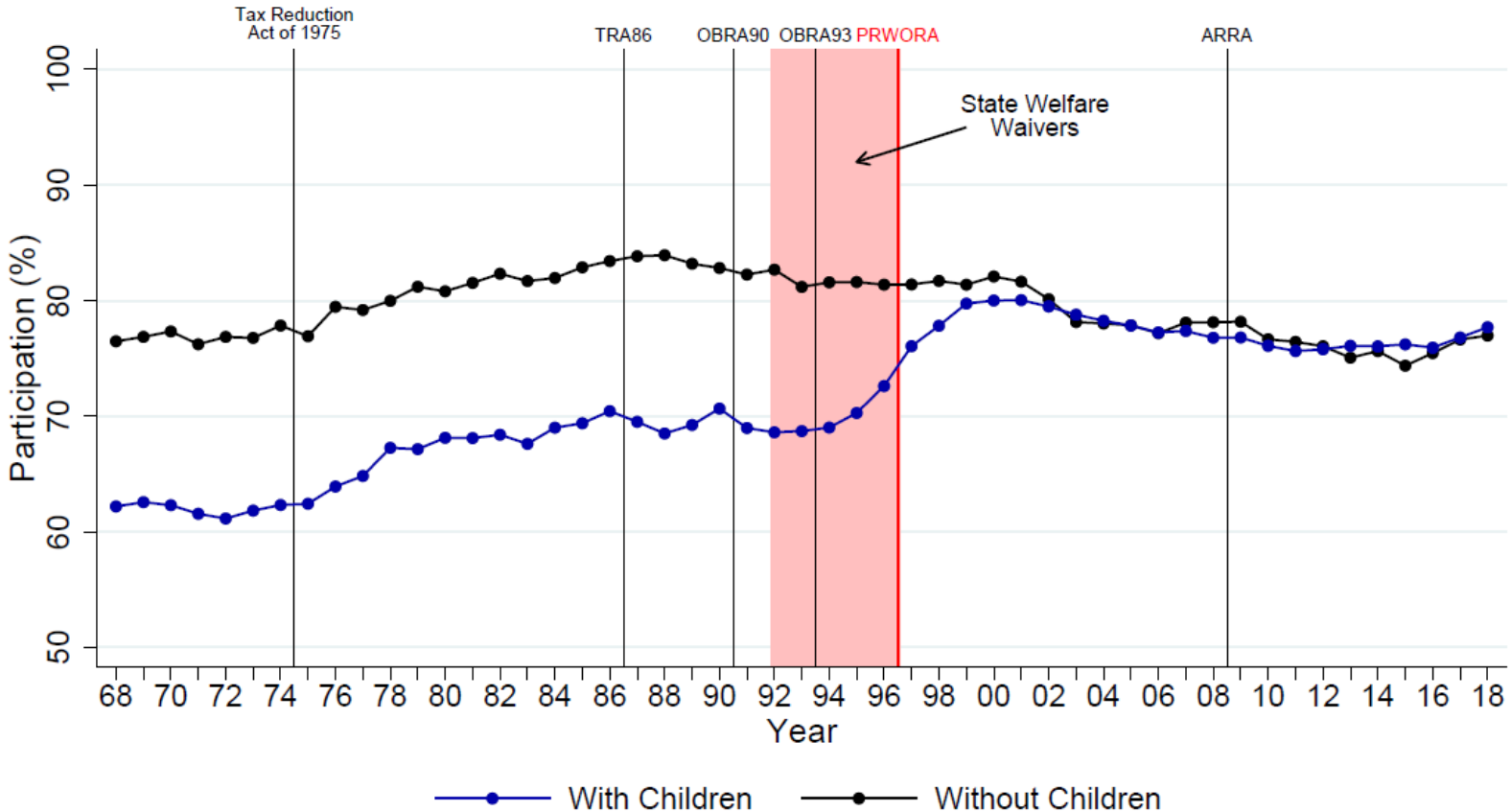
- **General lesson : knowledge of policy is key**
  - key explanatory variable in estimation of behavioural responses
  - Information is a powerful and inexpensive policy tool to affect behaviour

Kleven (JPuBE, 2024) : challenging the consensus

- **The consensus**
  - Extensive margin is sizeable, and justifies programmes like the EITC (WFTC, *Prime d'activité*, etc.)
  - Consensus originates from
    - labour supply literature (Heckman, 1993)
    - macro literature (Rogerson, 1988)
    - evaluation of EITC (Eissa and Liebman, 1996)

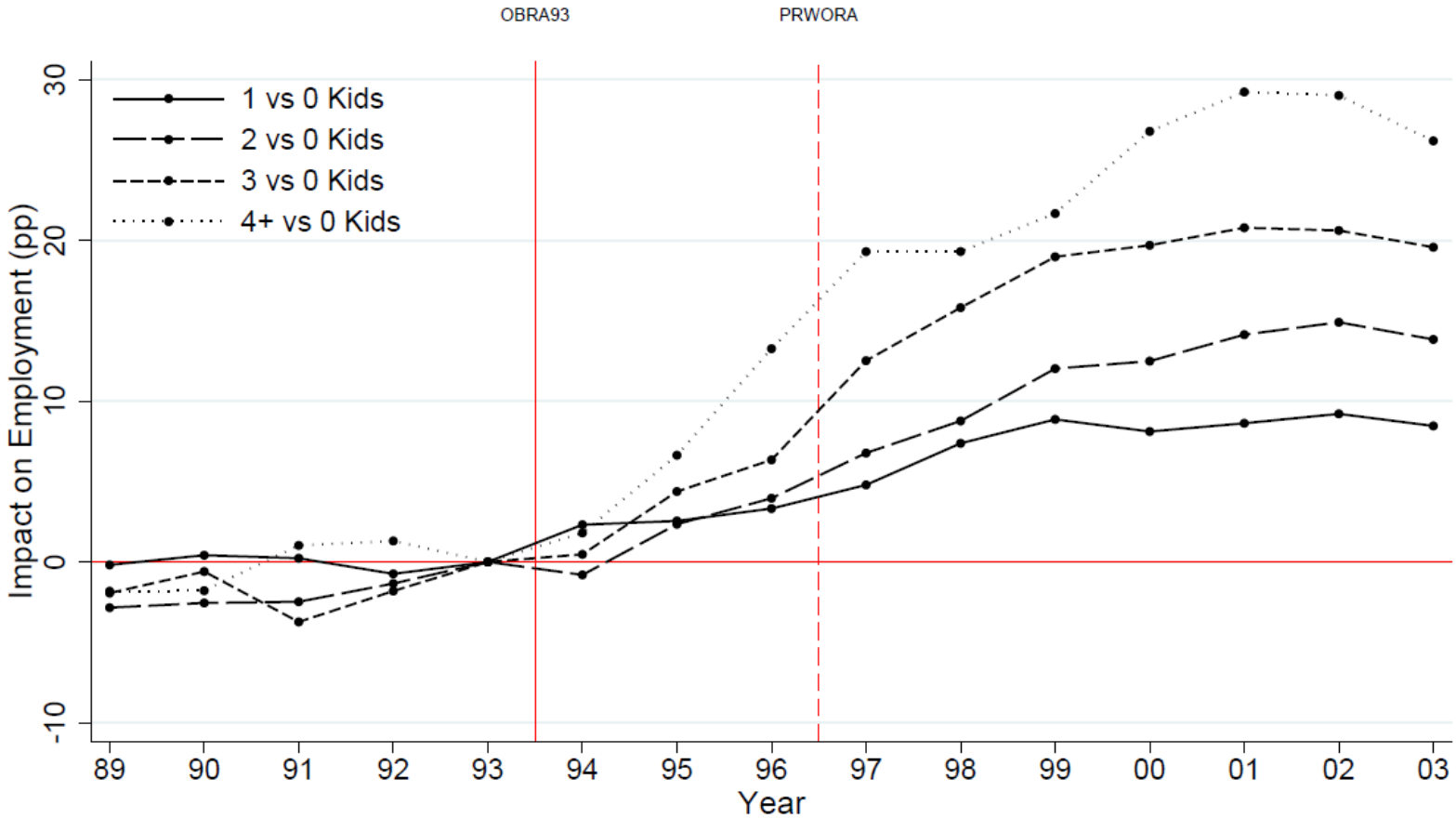
- **Kleven's Reappraisal**
  - The consensus view on the EITC and the extensive margin is fragile at best
  - Only one period in the U.S. leads to strong effects (OBRA 93)
  - Strong responses from individuals not affected by EITC (with 3+ kids)
  - Other countries have found much smaller effects, e.g., UK (Brewer et al. 2005)

Figure 86 – Labor Force Participation of Single Women With and Without Children



Source : Kleven (2024).

Figure 87 – Employment of Single Women : DiD by Number of Children



Source : Kleven (2024).

Figure 88 – Stacked Event Studies : Single Women With vs. Without Children

Source : Kleven (2024).

Kleven (2024) : challenging the consensus

- **Explaining the large increase in employment of U.S. single mothers**
  - No question that employment of US single mothers dramatically increased in one short period of time
  - States welfare reform (e.g., time limits, work requirements, training and job search activities)
  - Strong economy
- **Behavioural issues**
  - EITC not very well known
  - Welfare reform was very salient
  - Welfare culture ("undeserving poor", etc.)

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Definitions

Average tax rate τ is the *proportion of income* R leading to tax T

$$\tau = \frac{T}{R}$$

Marginal tax rate μ is the *share of tax on additional unit of income*

$$\mu = \frac{\partial T}{\partial R}$$

Progressivity A tax schedule is said progressive if the average tax rate is increasing with income

Regressivity A tax schedule is said progressive if the average tax rate is increasing with income