Empirical Evidence and Tax Policy Design: Lessons from the Mirrlees Review

44th Annual Conference of the CEA

May 2010

Richard Blundell

University College London and Institute for Fiscal Studies

Institute for Fiscal Studies

Empirical Evidence and Tax Policy Design

- First, a little background to the Mirrlees Review

- Then a discussion on the role of evidence loosely organised under five headings:

1. Key margins of adjustment to tax reform

2. Measurement of effective tax rates

3. The importance of information, complexity and salience

4. Evidence on the size of responses

5. Implications for tax design

- Focus on earnings tax and indirect tax design as leading examples

Institute for Fiscal Studies

The Mirrlees Review
Reforming the Tax System for the 21st Century

Editorial Team

Chairman: Sir James Mirrlees

Tim Besley (LSE & IFS)

Richard Blundell (UCL & IFS)

Malcolm Gammie QC (One Essex Court & IFS)

James Poterba (MIT & NBER)

Stuart Adam (IFS)

Steve Bond (Oxford & IFS)

Robert Chote (IFS)

Paul Johnson (IFS & Frontier)

Gareth Myles (Exeter & IFS)

Institute for Fiscal Studies

The Mirrlees Review

- Review of tax design from first principles
  - For modern open economies in general and UK in particular
  - Reflect changes in the world, changes in our understanding and increased empirical knowledge

- Two volumes:
  - 'Dimensions of Tax Design': a set of 13 chapters on particular areas co-authored by international experts and IFS researchers, along with expert commentaries (MRI)
  - 'Tax by Design': an integrated picture of tax design and reform, written by the editors (MRII)
  - http://www.ifs.org.uk/mirrleesReview/publications

- MRI on the web and at OUP.

Institute for
Fiscal Studies

Dimensions of Tax Design: commissioned chapters and expert commentaries (1)

- **The base for direct taxation**

  James Banks and Peter Diamond; Commentators: Robert Hall; John Kay; Pierre Pestieau

- **Means testing and tax rates on earnings**

  Mike Brewer, Emmanuel Saez and Andrew Shephard; Commentators: Hilary Hoynes; Guy Laroque; Robert Moffitt

- **Value added tax and excises**

  Ian Crawford, Michael Keen and Stephen Smith; Commentators: Richard Bird; Ian Dickson/David White; Jon Gruber

- **Environmental taxation**

  Don Fullerton, Andrew Leicester and Stephen Smith; Commentators: Lawrence Goulder; Agnar Sandmo

- **Taxation of wealth and wealth transfers**

  Robin Boadway, Emma Chamberlain and Carl Emmerson; Commentators: Helmuth Cremer; Thomas Piketty; Martin Weale

Institute for
Fiscal Studies

Dimensions of Tax Design: commissioned chapters and expert commentaries (2)

- International capital taxation

  Rachel Griffith, James Hines and Peter Birch Sørensen; Commentators: Julian Alworth; Roger Gordon and Jerry Hausman

- Taxing corporate income

  Alan Auerbach, Mike Devereux and Helen Simpson; Commentators: Harry Huizinga; Jack Mintz

- Taxation of small businesses

  Claire Crawford and Judith Freedman

- The effect of taxes on consumption and saving

  Orazio Attanasio and Matthew Wakefield

- Administration and compliance, *Jonathan Shaw, Joel Slemrod and John Whiting; Commentators: John Hasseldine; Anne Redston; Richard Highfield*

- Political economy of tax reform, *James Alt, Ian Preston and Luke Sibieta; Commentator: Guido Tabellini*

Institute for Fiscal Studies

Increased empirical knowledge: – some examples

- labour supply responses for individuals and families
    - at the intensive and extensive margins
    - by age and demographic structure
- taxable income elasticities
    - top of the income distribution using tax return information
- consumer responses to indirect taxation
    - importance (or not) of nonseparability and variation in price elasticities
- intertemporal responses
    - consumption, savings and pensions
- Income uncertainty
    - persistence and magnitude of earnings shocks over the life-cycle
- ability to (micro-)simulate marginal and average rates
    - simulate 'optimal' reforms

Institute for
Fiscal Studies

Empirical Evidence and Tax Policy Design

- Here I will focus on earnings taxation and indirect taxation:

- Leading examples of the mix of theory and evidence

- Key implications for tax design

- Earnings taxation, in particular, takes most of the strain in distributional adjustments of other parts of the reform package
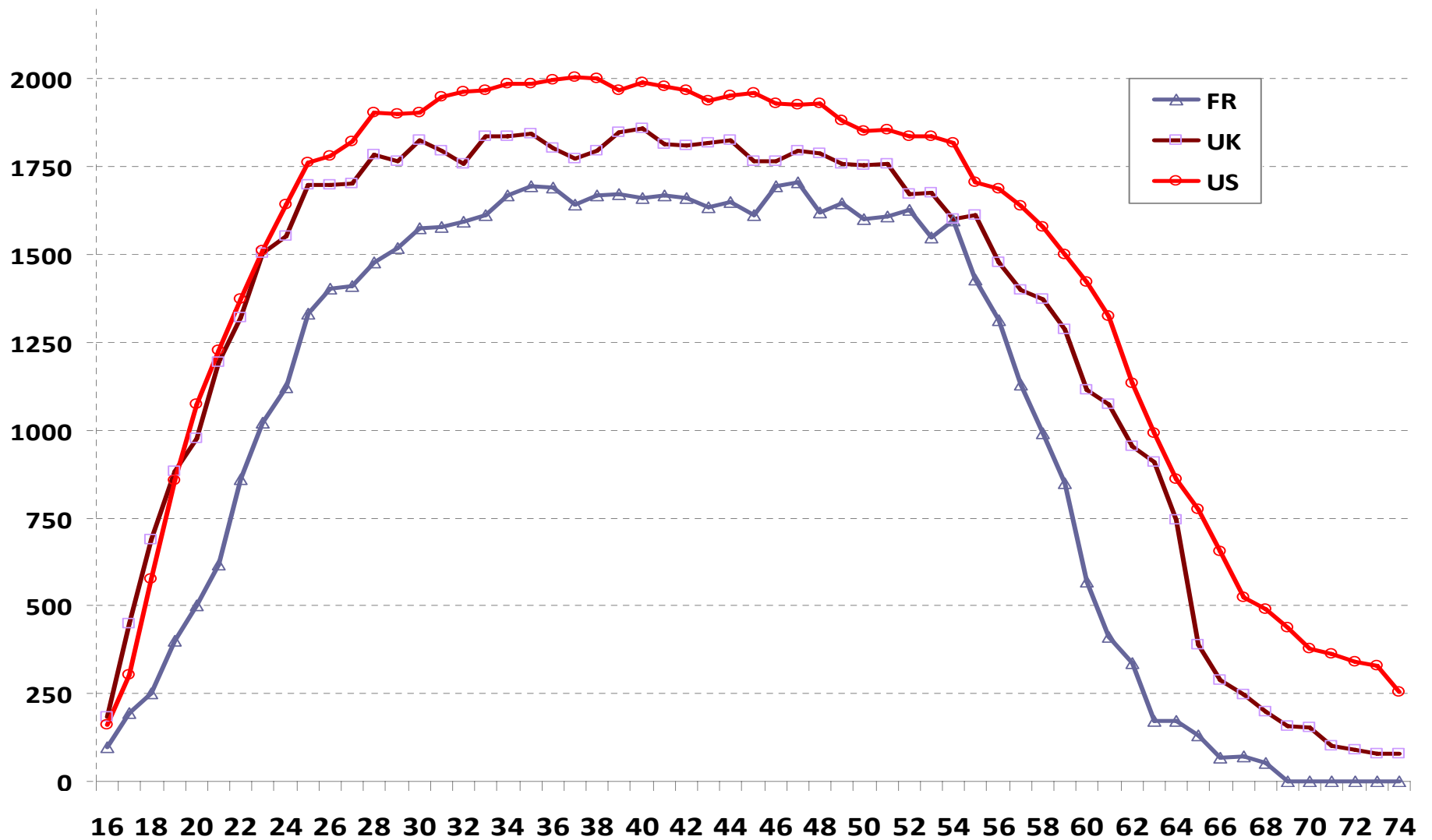
Key Margins of Adjustment

- Extensive and intensive margins of labour supply

- Its not all the extensive margin

  - Intensive and extensive margins both matter

  - They matter for tax policy evaluation and design

  - And they matter in different ways by age and demographic groups

- Getting it right for men

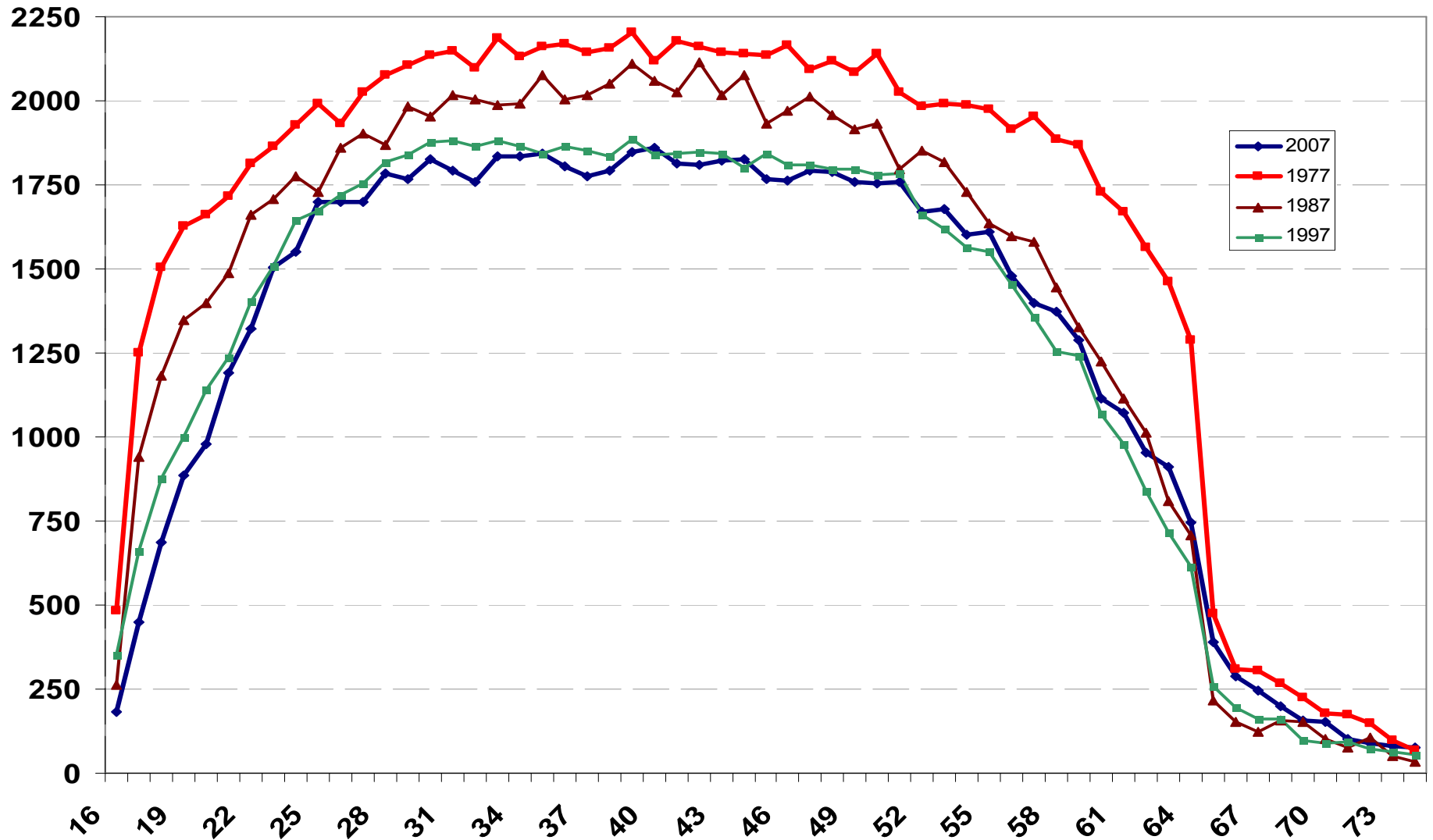# Employment for men by age – FR, UK and US 2007
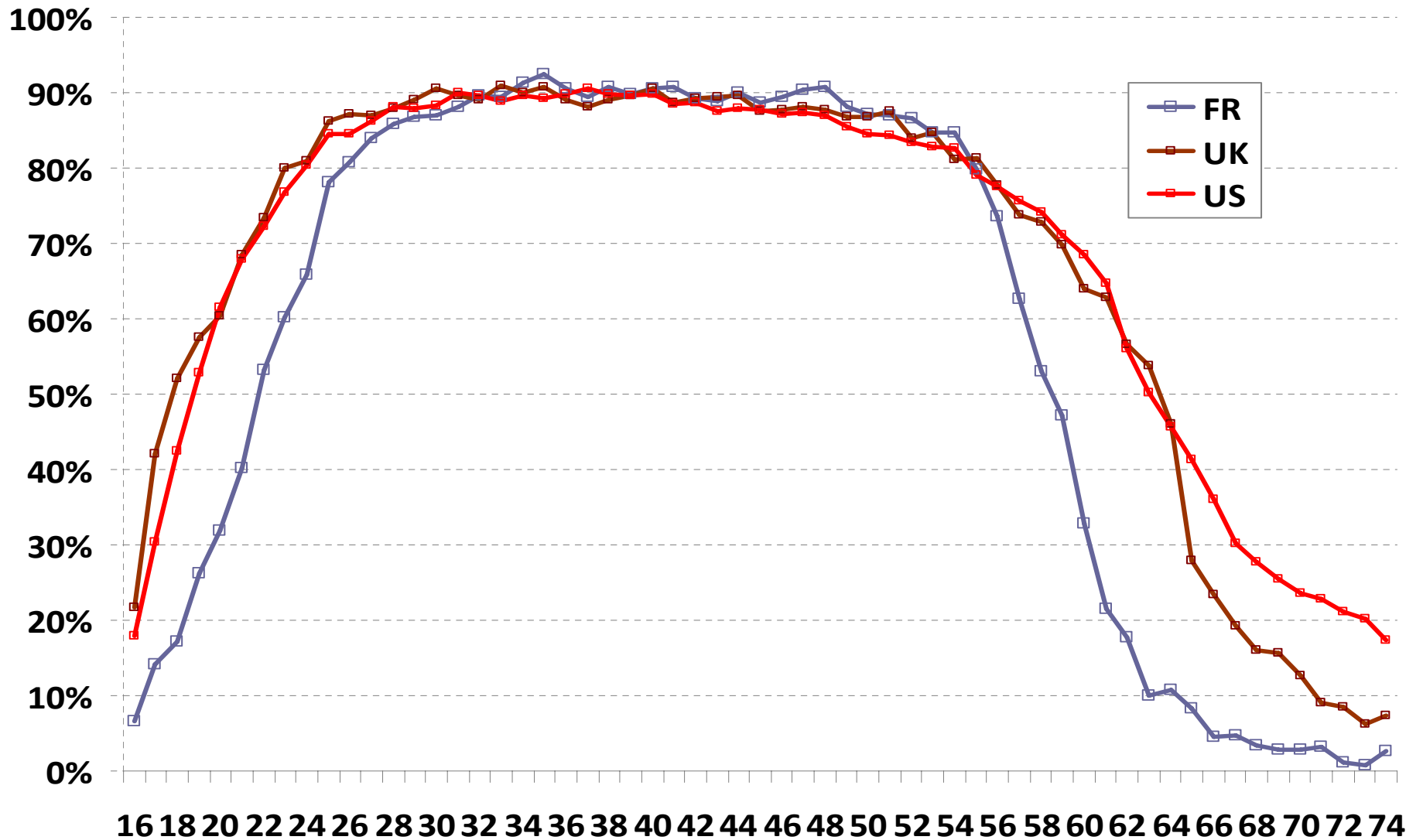
Blundell, Bozio and Laroque (2010)

Institute for Fiscal Studies

Total Hours for men by age – FR, UK and US 2007

Blundell, Bozio and Laroque (2010)

Institute for Fiscal Studies

Total Hours for men by age in the UK: 1977 - 2007
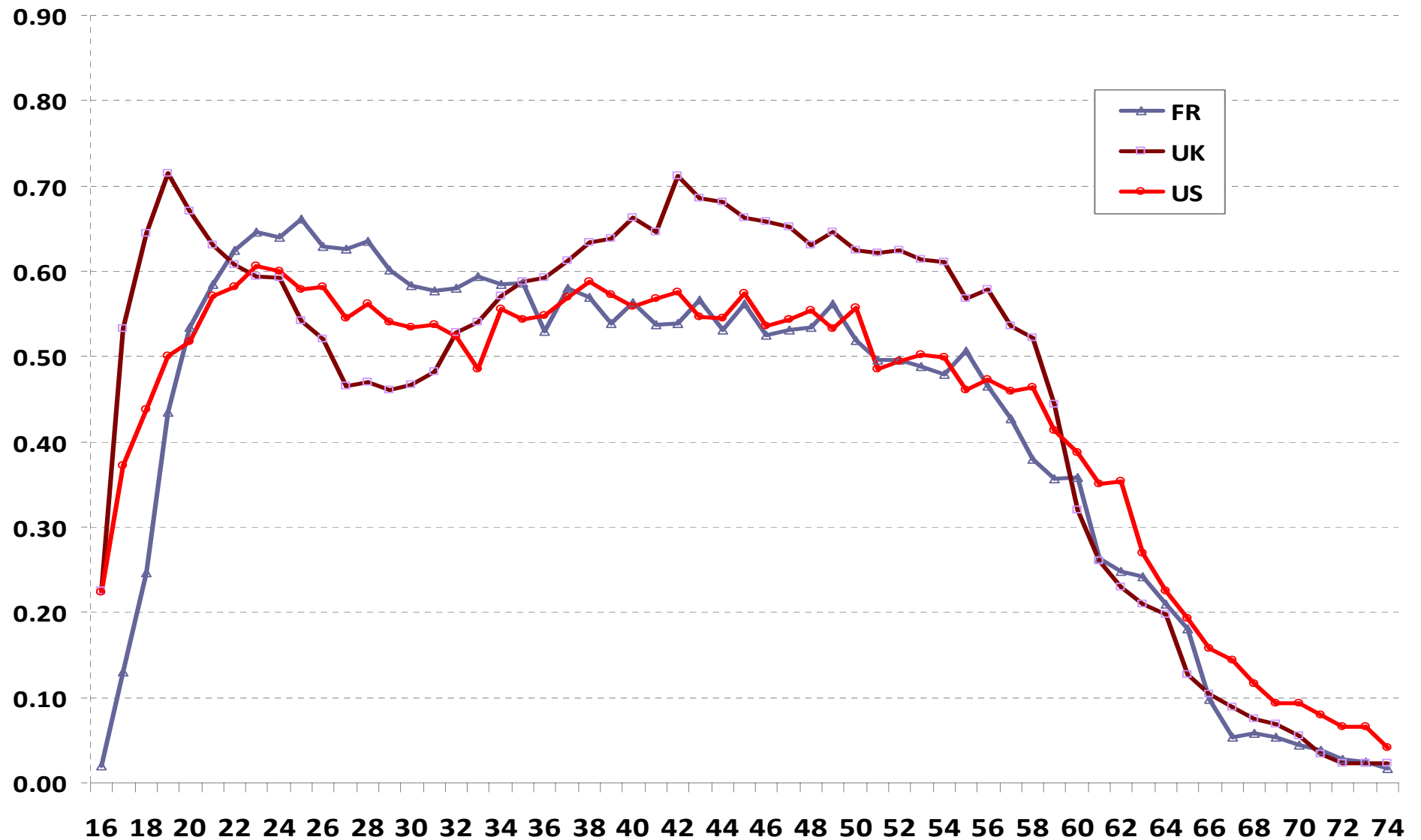

Blundell, Bozio and Laroque (2010)
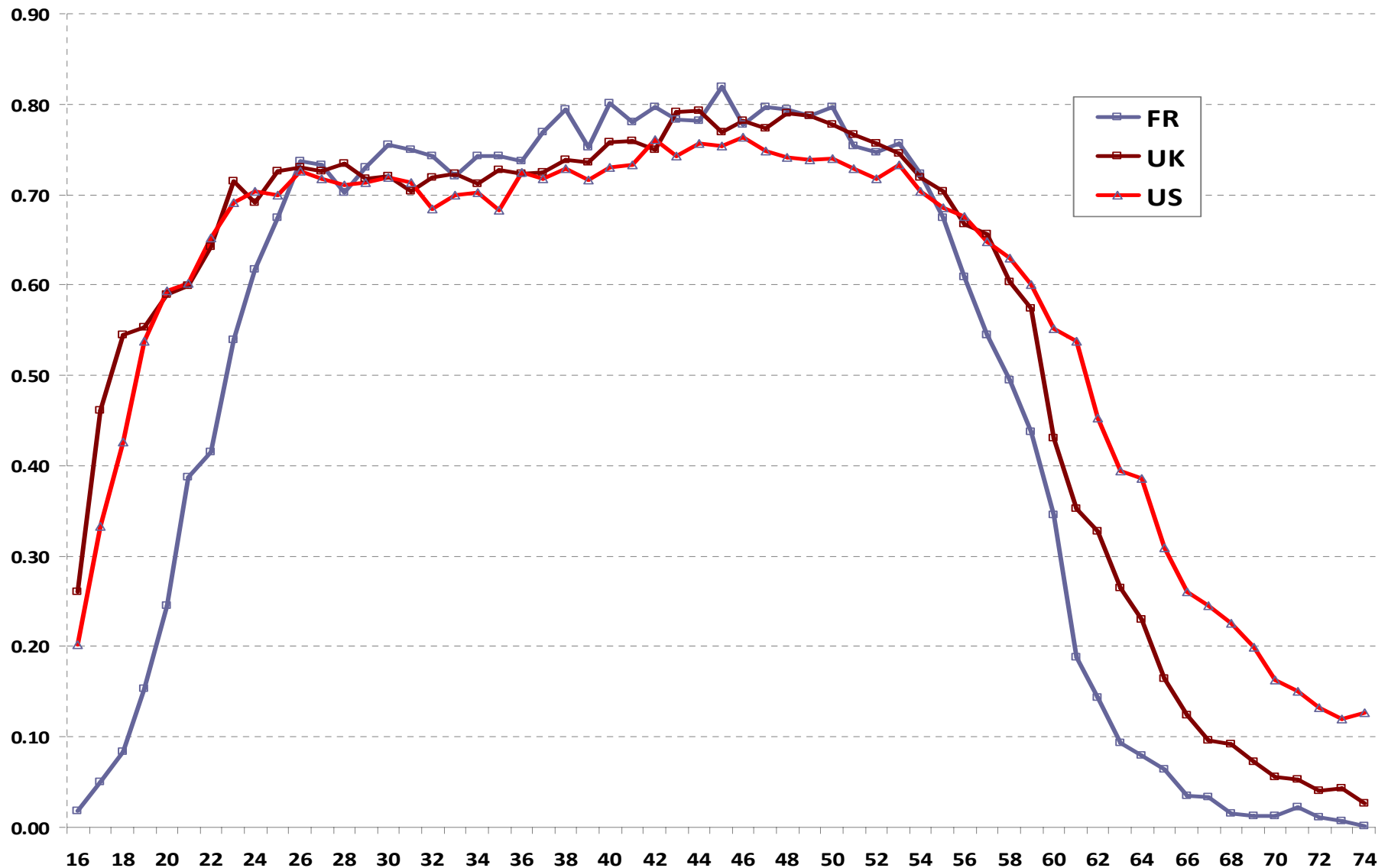
Institute for Fiscal Studies

Key Margins of Adjustment

- Extensive and extensive margins for women

Female Employment by age – US, FR and UK 1977

Blundell, Bozio and Laroque (2010)
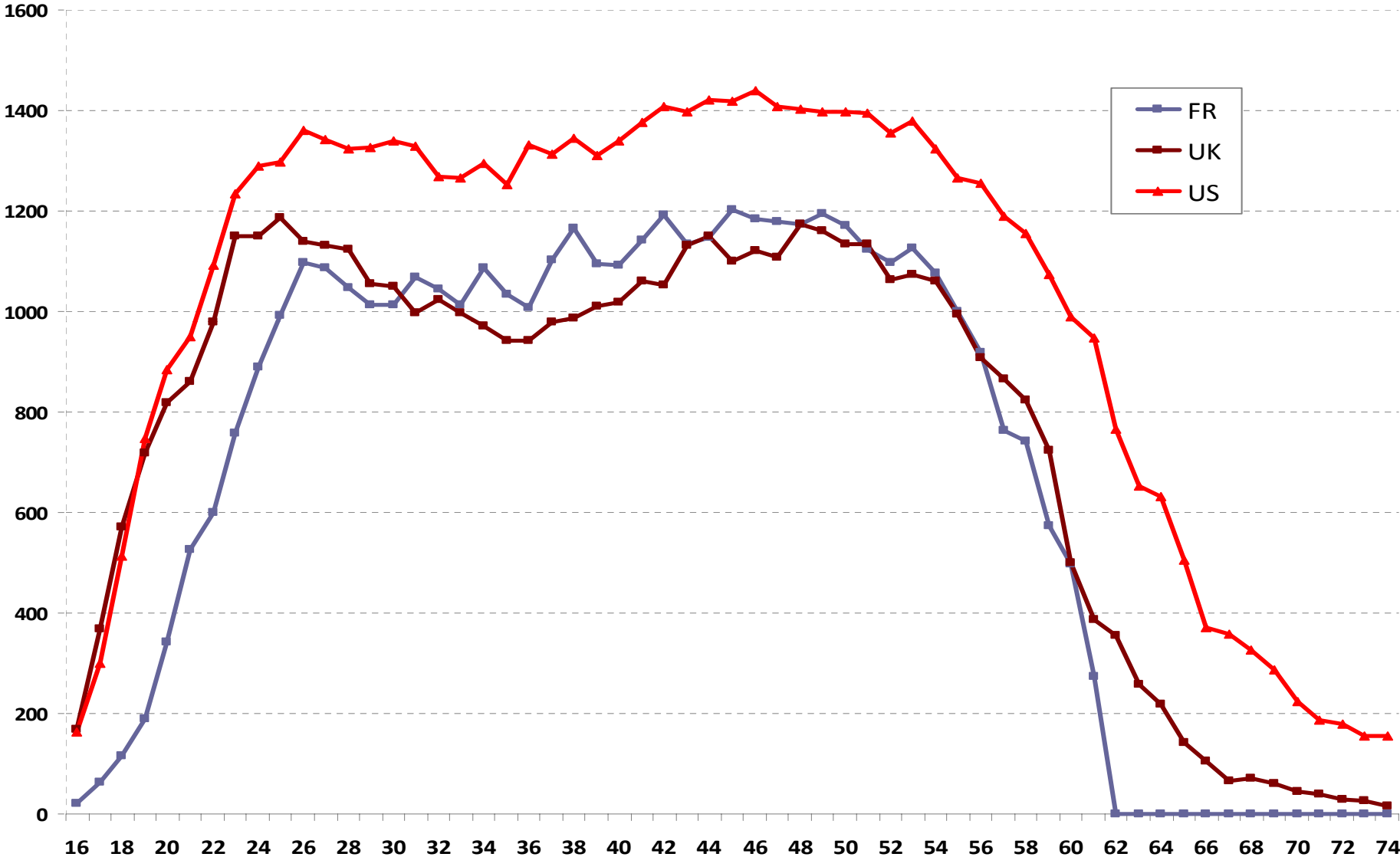
Institute for
Fiscal Studies

Female Employment by age – US, FR and UK 2007

Blundell, Bozio and Laroque (2010)

Institute for Fiscal Studies

Female Hours by age – US, FR and UK 2007

Blundell, Bozio and Laroque (2010)

Institute for
Fiscal Studies

Female Hours by age – US, FR and UK 1977

Blundell, Bozio and Laroque (2010)

Institute for
Fiscal Studies

The extensive – intensive distinction is important for a number of reasons
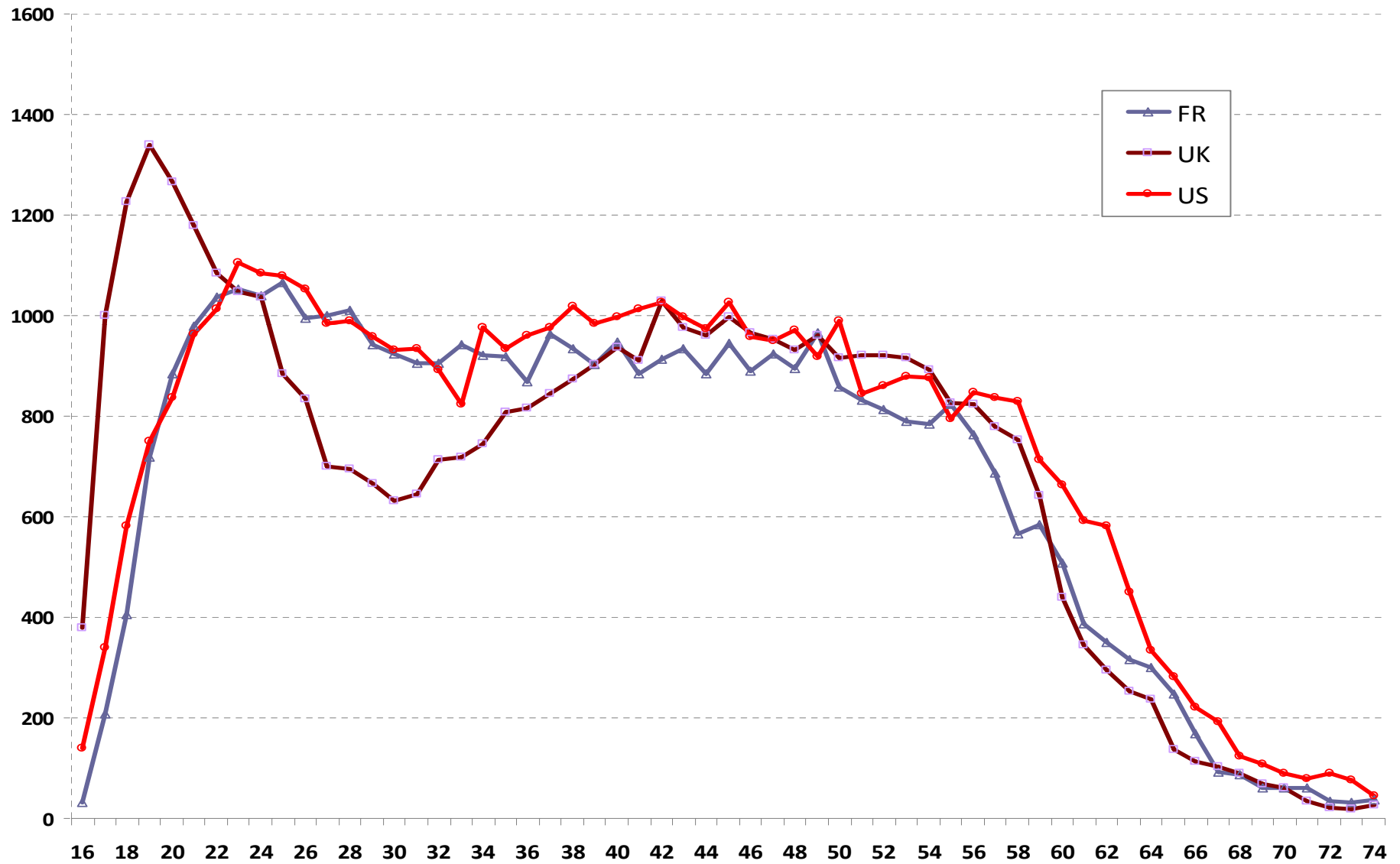
- Understanding responses to tax and welfare reform
  - Heckman, Rogerson, Wise, .. all highlight the importance of extensive labour supply margin
  - Blundell, Bozio and Laroque (2010)
- The extensive and intensive elasticities are also key parameters in the recent literature on tax design – used heavily in the Mirrlees Review.
- But these elasticities have changed over time and the relative importance of the extensive margin is specific to particular groups
- I'll examine a specific example in more detail in what follows

Why is this distinction important for tax design?

- Some key lessons from recent tax design theory (Saez, Laroque, ..)

- A 'large' extensive elasticity at low earnings can 'turn around' the impact of declining social weights

  – implying a higher transfer to low earning workers than those out of work

  – a role for earned income tax credits

- But how do individuals perceive the tax rates on earnings implicit in the tax credit and benefit system - salience?

  – are individuals more likely to 'take-up' if generosity increases?

- Importance of margins other than labour supply/hours

- Use of taxable income elasticities to guide choice of top tax rates

An Analysis in Two Steps

- The <u>first step</u> (impact) is a positive analysis of household decisions. There are two dominant empirical approaches to the measurement of the impact of tax reform

    - both prove useful:

    - 1. A 'quasi-experimental' evaluation of the impact of historic reforms /and randomised experiments

    - 2. A 'structural' estimation based on a general discrete choice model with (unobserved) heterogeneity

- The <u>second step</u> (optimality) is the normative analysis or optimal policy analysis

    - Examines how to best design benefits, in-work tax credits and earnings tax rates with (un)observed heterogeneity and unobserved earnings 'capacity'

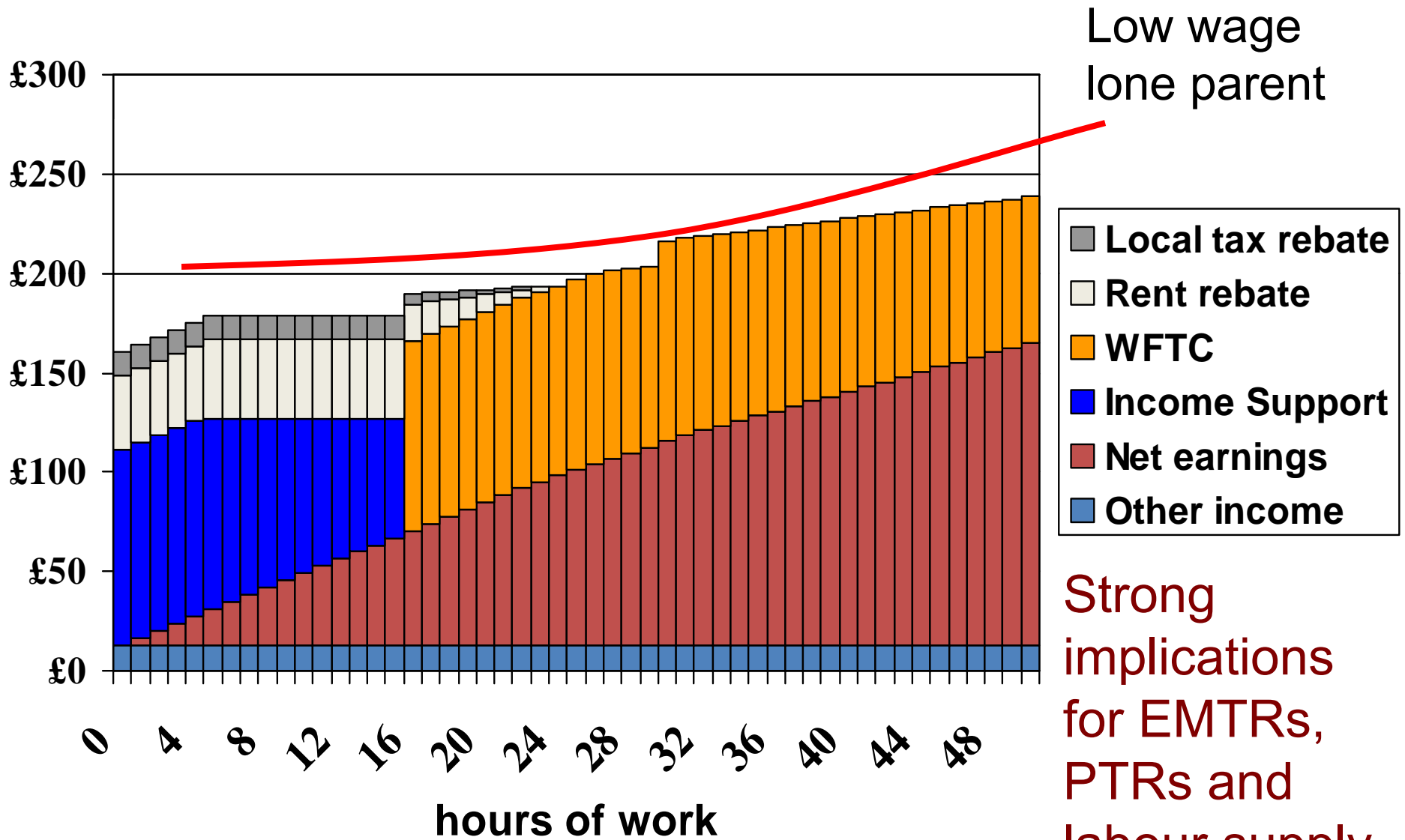# Alternative approaches to measuring the impact:

- Structural model
  - Simulate effect of actual or hypothetical reforms
  - Useful for optimal design too, but, robust?

- Quasi-experiment/Difference-in-differences
  - Compares outcomes of eligibles and non-eligibles and estimates 'average' impact of past reform
  - Only <u>indirectly</u> related to what is needed for optimal design

- Randomised experiment? SSP?
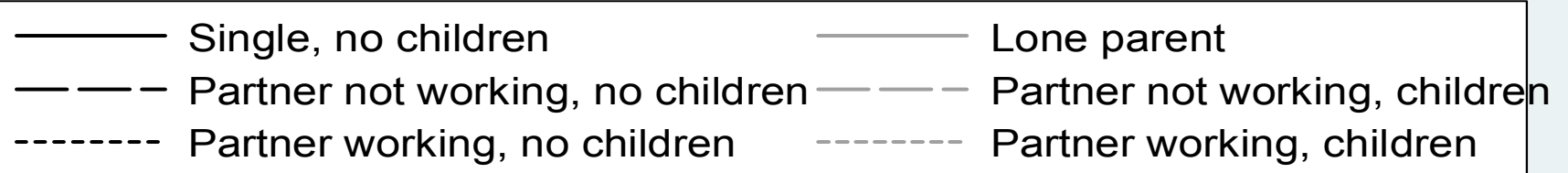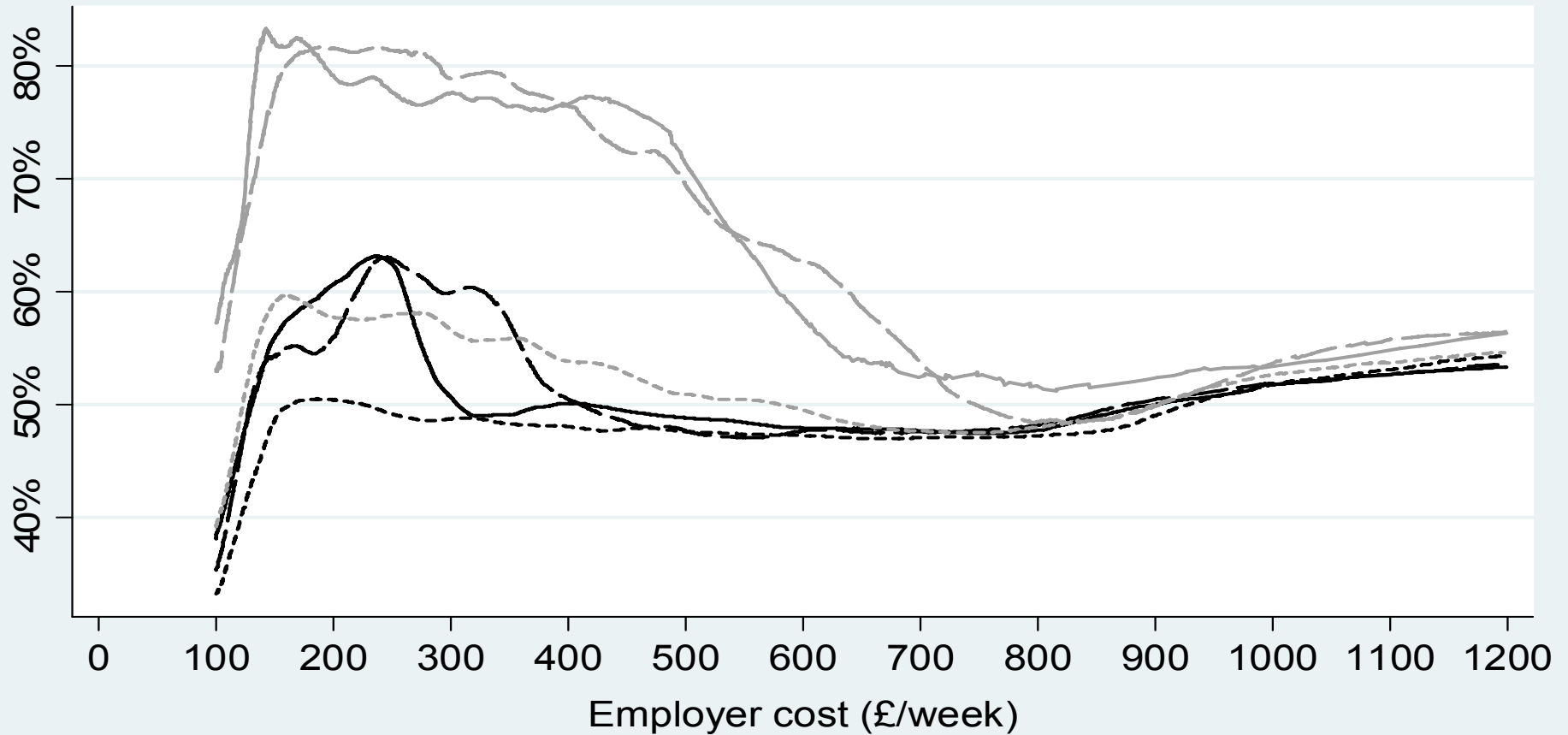
Focus here on tax rates on lower incomes

Main defects in current welfare/benefit systems

- Participation tax rates at the bottom remain very high in UK and elsewhere

- Marginal tax rates are well over 80% for some low income working families because of phasing-out of means-tested benefits and tax credits

  - Working Families Tax Credit + Housing Benefit in UK

  - and interactions with the income tax system

  - for example, we can examine a typical budget constraint for a single mother…

Institute for Fiscal Studies

The interaction of WFTC with other benefits in the UK

Low wage lone parent

Legend:
- Local tax rebate
- Rent rebate
- WFTC
- Income Support
- Net earnings
- Other income

Strong implications for EMTRs, PTRs and labour supply

Y-axis: £0, £50, £100, £150, £200, £250, £300

X-axis: hours of work — 0, 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48
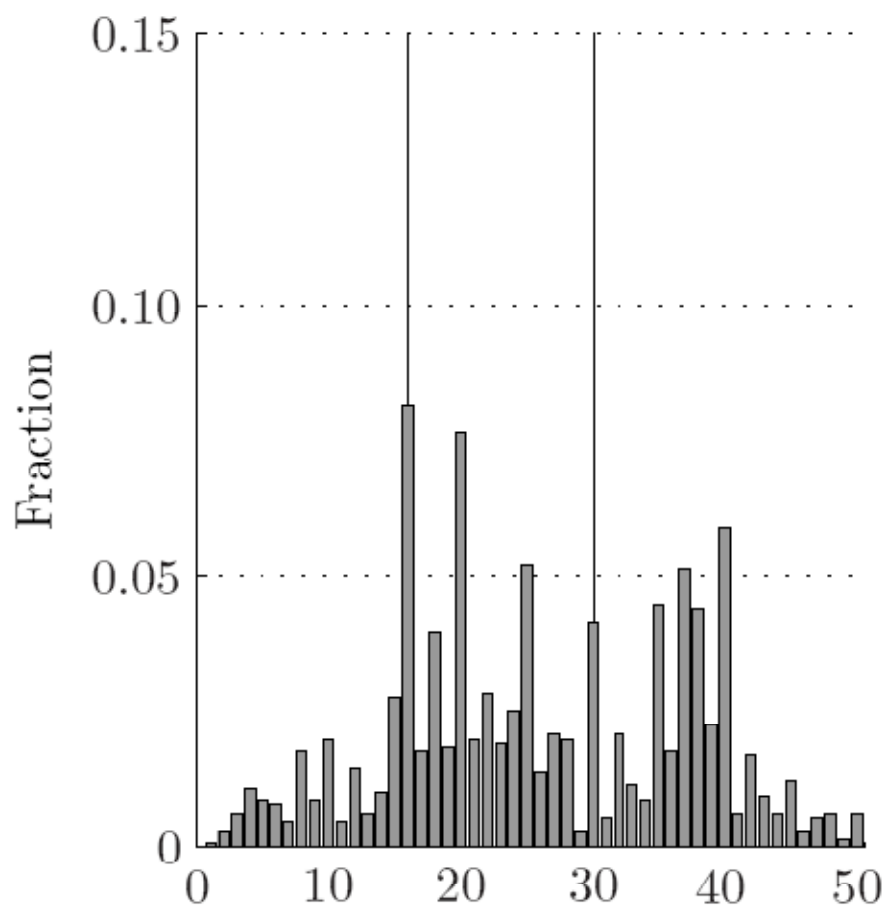
Average EMTRs across the earnings distribution for different family types

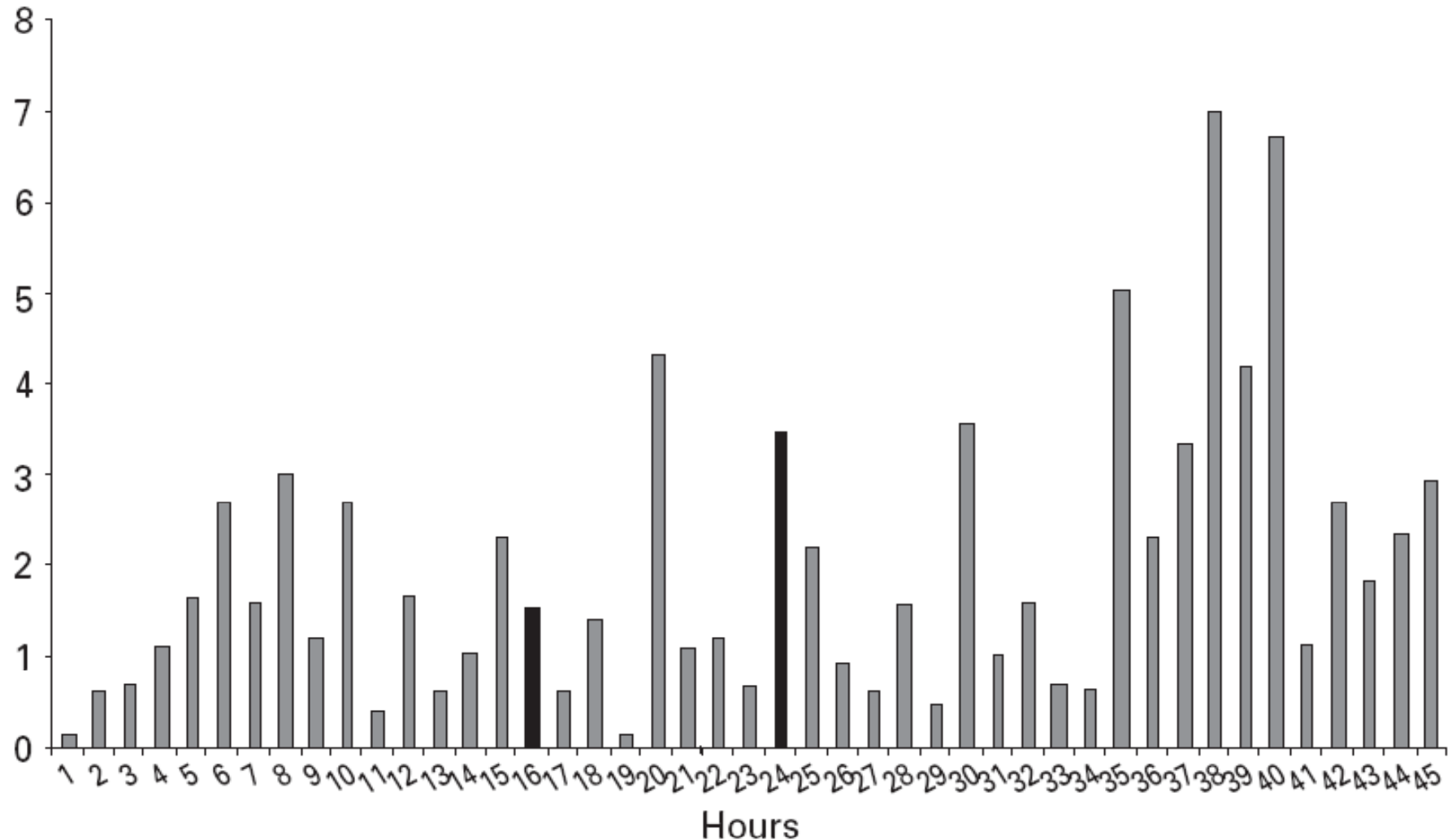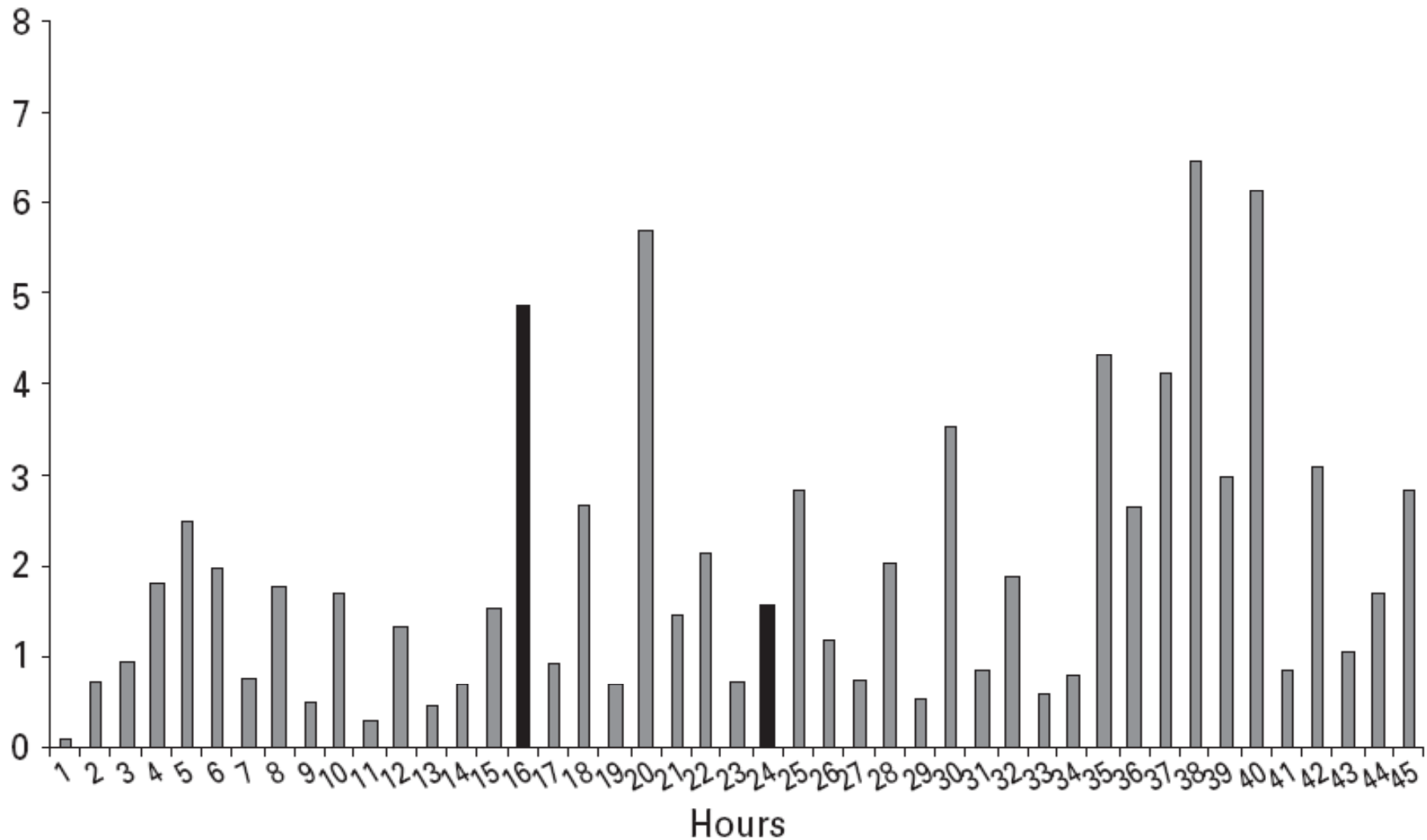# Can the reforms explain weekly hours worked?

Single Women (aged 18-45) - 2002
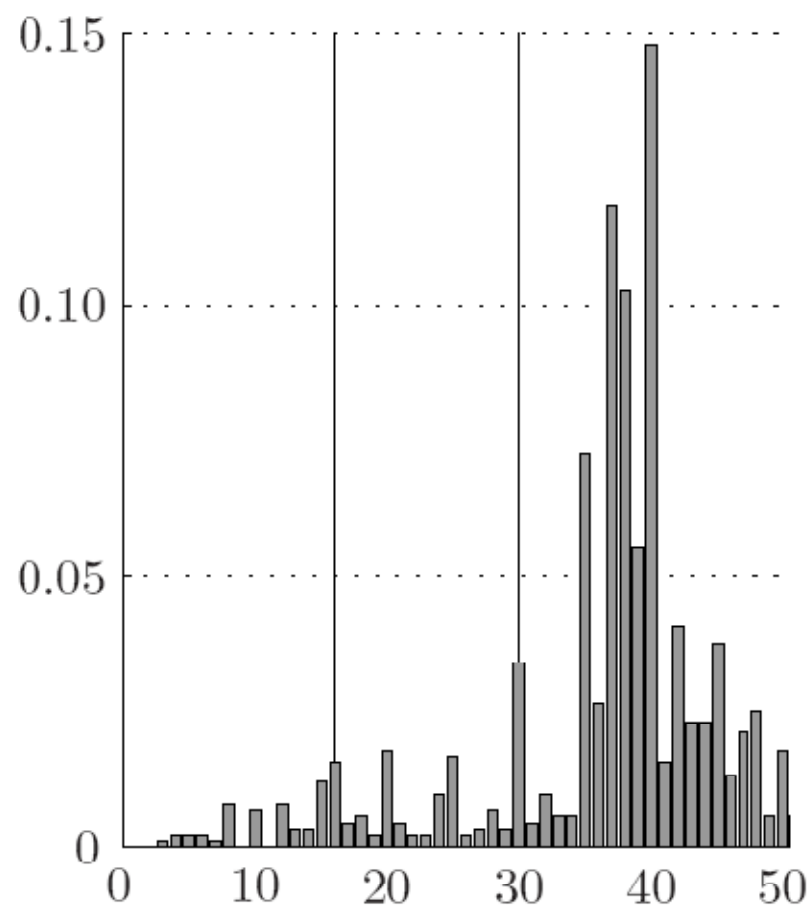
Blundell and Shephard (2010)

Hours' distribution for lone parents, before

Blundell and Shephard (2010)

Institute for Fiscal Studies

Hours' distribution for lone parents, after

Blundell and Shephard (2010)

WFTC Reform: Quasi-experimental Evaluation
Matched Difference-in-Differences

Average Impact on % Employment Rate of Single Mothers

Single Mothers	Marginal Effect	Standard Error	Sample Size
Family Resources Survey	3.5	1.55	25,163
Labour Force Survey	3.6	0.55	233,208

Data: FRS, 45,000 adults per year, Spring 1996 – Spring 2002.

Base employment level: 45% in Spring 1997.

Matching Covariates: age, education, region, ethnicity,..

But quasi-experimental evidence is rarely enough for tax design
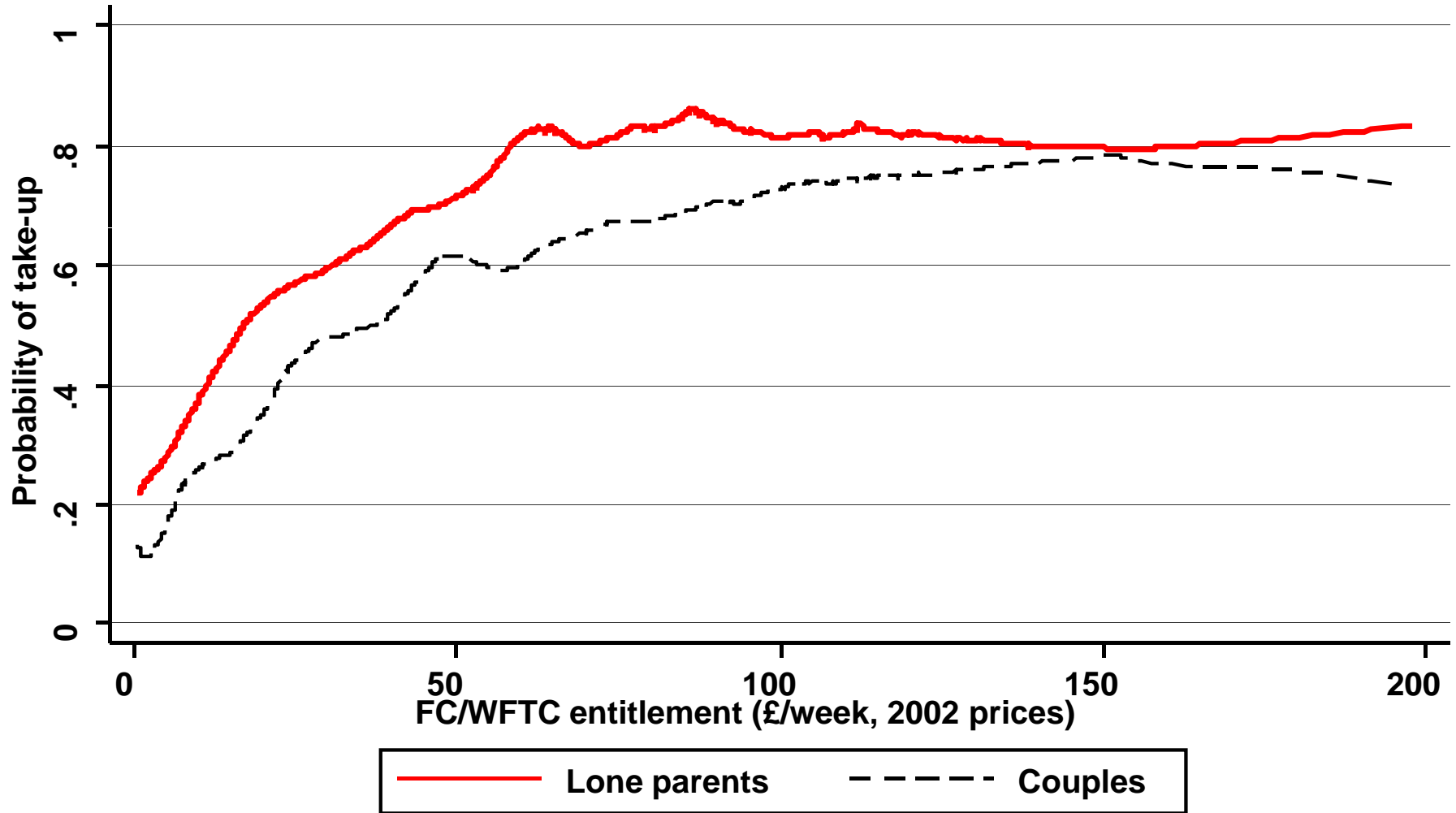
Key features of the structural model

Preferences $\qquad U(c_h, h; X, \varepsilon)$

typically approximated by shape constrained sieves

- Structural model also allows for

  - unobserved work-related fixed costs

  - childcare costs

  - observed and unobserved heterogeneity

  - programme participation 'take-up' costs

Importance of take-up and information/hassle costs
Variation in take-up probability with entitlement to FC/WFTC

Key features of the structural model

main elements:

- budget constraint – tax/tax-credit and benefit interactions

- heterogeneity – demographics, ethnicity, etc; unobs. het.

- fixed costs of work – obs. and unobs. het.

- stigma/hassle costs – take-up versus eligibility; unobs het.

- childcare costs

- mixed-multinomial specification across discrete choices over ranges of hours.

What about the size of labour supply responses?

Structural Model Elasticities – low education lone parents

(b) Youngest Child Aged 4-11

Weekly Earnings	Density	Extensive	Intensive
0	0.4327		
50	0.1575	0.380 (.020)	0.085 (.009)
150	0.1655	0.321 (.009)	0.219 (.025)
250	0.1298	0.172 (.005)	0.194 (.020)
350	0.028	0.068 (.003)	0.102 (.010)
Employment elasticity		0.820 (.042)	

Blundell and Shephard (2010)

Institute for Fiscal Studies

Structural Model Elasticities – low education lone parents

(b) Youngest Child Aged 11-18

Weekly Earnings	Density	Extensive	Intensive
0	0.3966		
50	0.1240	0.144 (.018)	0.130 (.016)
150	0.1453	0.153 (.008)	0.387 (.042)
250	0.1723	0.097 (.004)	0.340 (.035)
350	0.1618	0.045 (.002)	0.170 (.015)
Employment elasticity		0.601 (.036)	

Blundell and Shephard (2010)

Institute for Fiscal Studies

Structural Model Elasticities – low education lone parents

(c) Youngest Child Aged 0-3

Weekly Earnings	Density	Extensive	Intensive
0	0.5942		
50	0.1694	0.168 (.017)	0.025 (.003)
150	0.0984	0.128 (.012)	0.077 (.012)
250	0.0767	0.043 (.004)	0.066 (.010)
350	0.0613	0.016 (.002)	0.035 (.005)
Participation elasticity		0.536 (.047)	

- Differences in intensive and extensive margins by age and demographics have strong implications for the design of the tax schedule... Non-monotonic in age of youngest child

  But do we believe the structural model estimates?

Structural Simulation of the WFTC Reform:
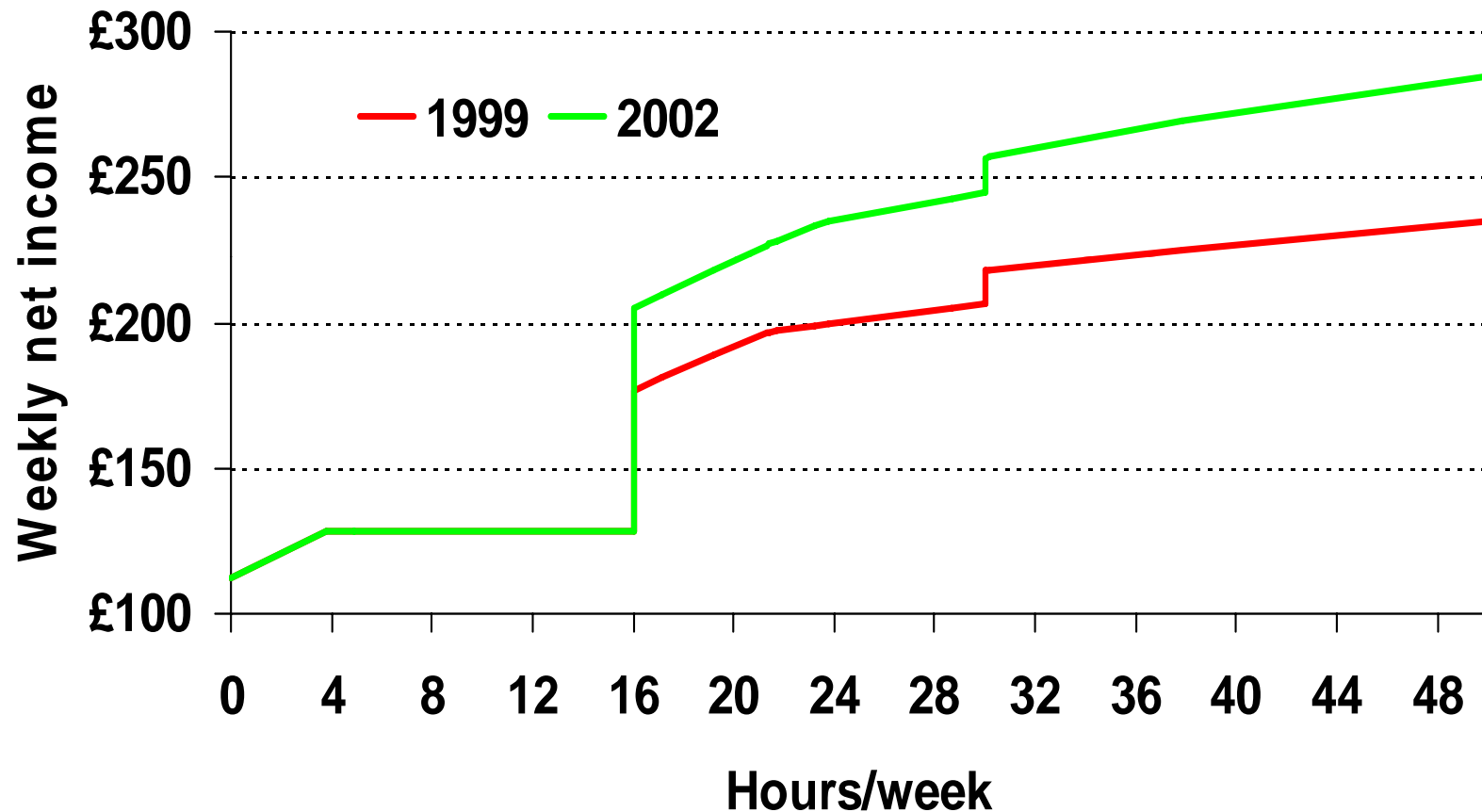
WFTC Tax Credit Reform

	All	y-child 0 to 2	y-child 3 to 4	y-child 5 to 10	y-child 11 to 18
Change in employment rate:	5.95	3.09	7.56	7.54	4.96
	0.74	*0.59*	*0.91*	*0.85*	*0.68*
Average change in hours:	1.79	0.71	2.09	2.35	1.65
	0.2	*0.14*	*0.23*	*0.34*	*0.2*

– relatively 'large' impact

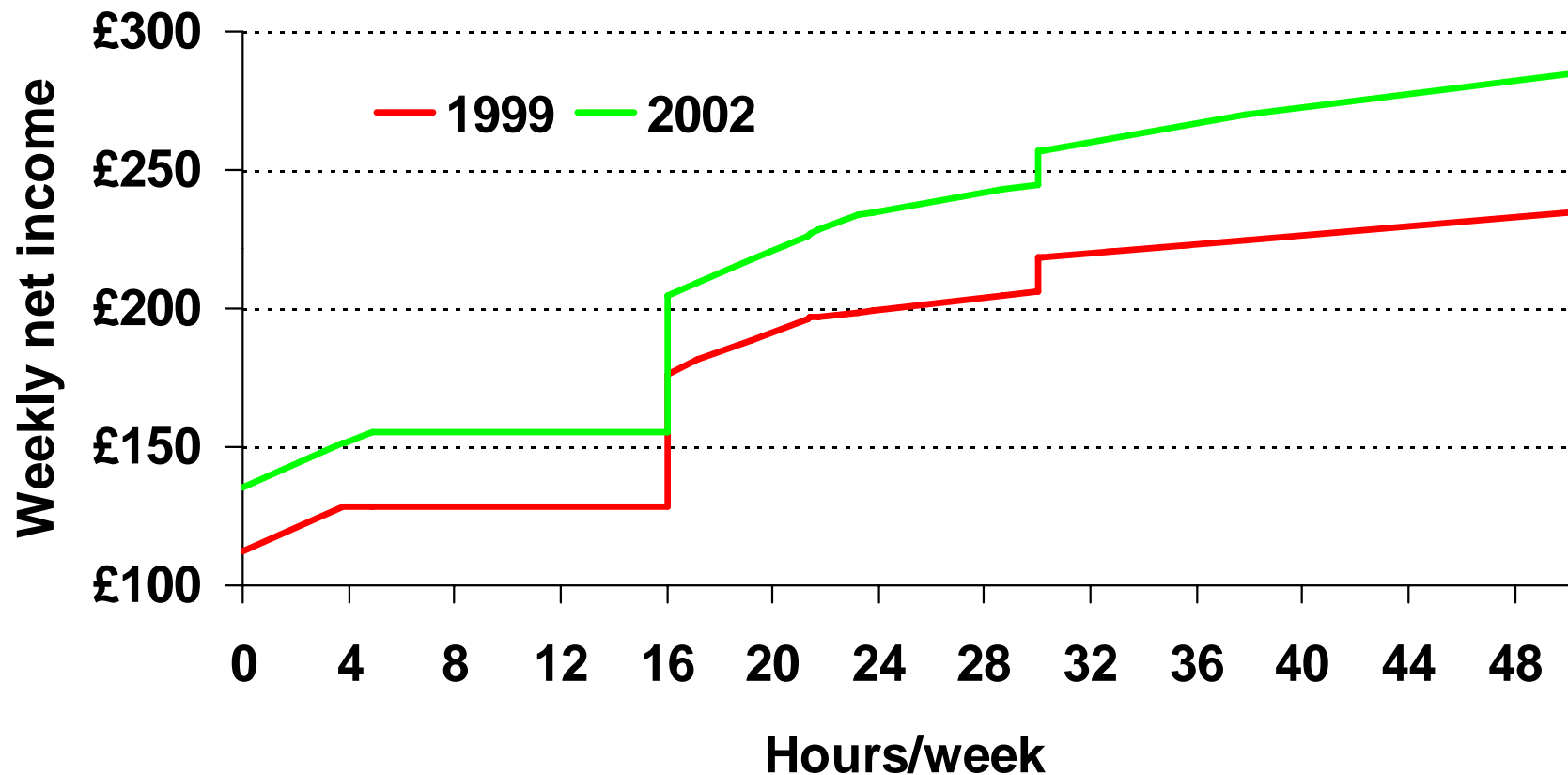Notes: Simulated on FRS data; Standard errors in italics.

Blundell and Shephard (2010)

Impact of WFTC reform on lone parent, 2 children

Notes: Two children under 5. Assumes hourly wage of £4.10, no housing costs or council tax liability and no childcare costs.

Institute for Fiscal Studies

Impact of WFTC and IS reforms on lone parent, 2 children

Notes: Two children under 5. Assumes hourly wage of £4.10, no housing costs or council tax liability and no childcare costs.

Institute for Fiscal Studies

Structural Simulation of the WFTC Reform:

Impact of all Reforms

	All	y-child	y-child	y-child	y-child
		0 to 2	3 to 4	5 to 10	11 to 18
Change in employment rate:	3.68	0.65	4.53	4.83	4.03
	0.84	*0.6*	*0.99*	*0.94*	*0.71*
Average change in hours:	1.02	0.01	1.15	1.41	1.24
	0.23	*0.21*	*0.28*	*0.28*	*0.22*

- shows the importance of getting the effective tax rates right especially when comparing with quasi-experiments.
  - Compare with experiment or quasi-experiment.

Institute for
Fiscal Studies

Evaluation of the 'ex-ante' structural model

- The diff-in-diff impact parameter can be identified from the structural evaluation model

- *Simulated* diff-in-diff parameter

- The structural model then defines the average impact of the policy on the treated as:

$$\alpha_{SEM}(X) = \Pr[h>0 \mid X, D=1] - \Pr[h>0 X, D=0]$$
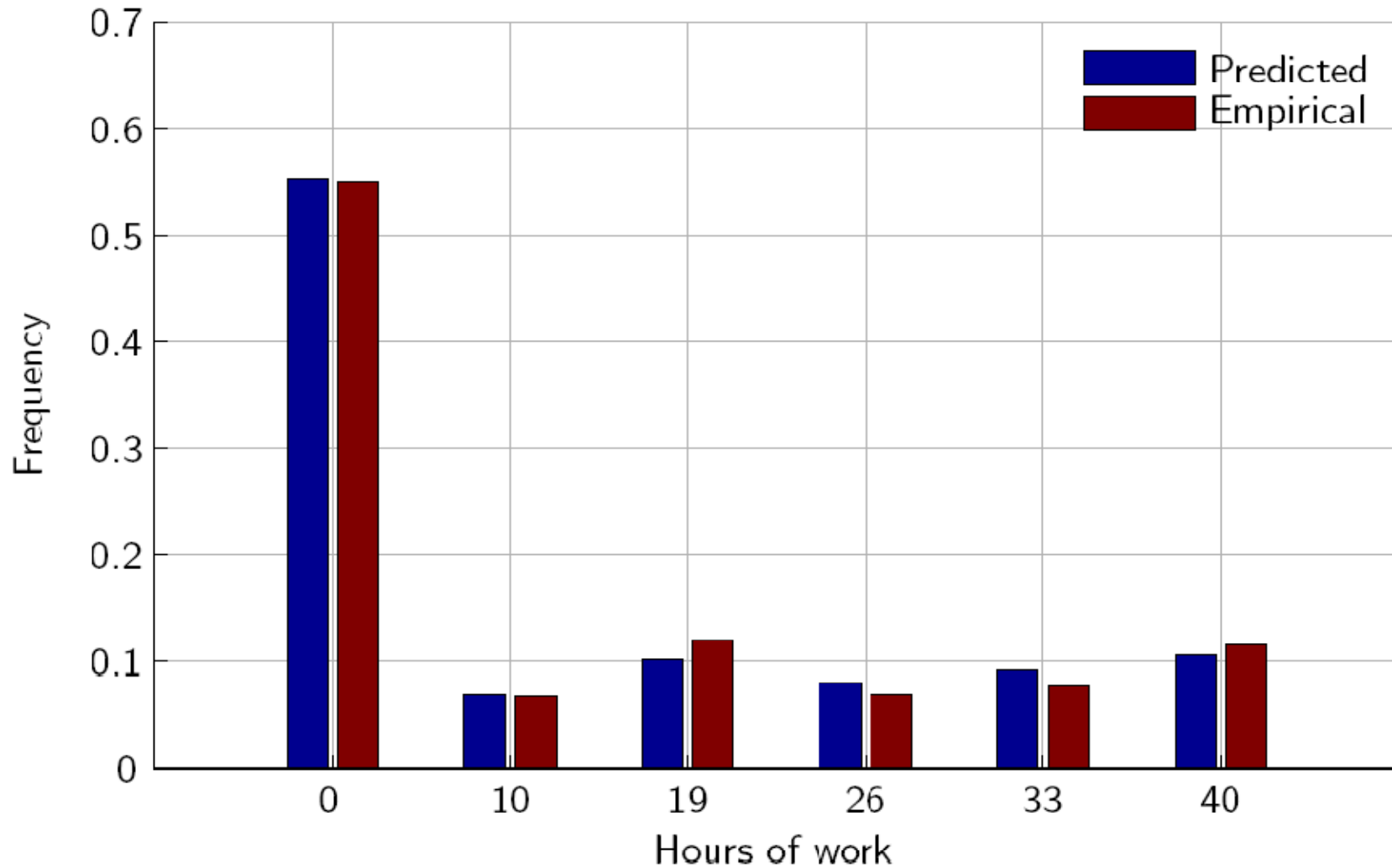
- Compare *simulated diff-in-diff moment* with *diff-in-diff*

$$\alpha_{SEM}^{DD} = \int_X \int_X \int_\varepsilon f(X,\varepsilon,D=1)dF_\varepsilon^{T=1,t=1}dF_X - \int_X \int_\varepsilon f(X,\varepsilon,D=0)dF_\varepsilon^{T=1,t=0}dF_X$$

$$- \left[\int_\varepsilon f(X,\varepsilon,D=0)dF_\varepsilon^{T=0,t=1}dF_X - \int_X \int_\varepsilon f(X,\varepsilon,D=0)dF_\varepsilon^{T=0,t=0}dF_X \right]$$

Evaluation of the ex-ante model

- The *simulated* diff-in-diff parameter from the structural evaluation model is precise and does not differ significantly from the diff-in-diff estimate [3.6 (.55)]

- Compare *simulated diff-in-diff moment* with *diff-in-diff*

  - .29 (.73), chi-square p-value .57

- Consider additional moments

  - education: low education: 0.33 (.41)

  - youngest child interaction

    - Youngest child aged < 5: .59 (. 51)

    - Youngest child aged 5-10: .31 (.35)

Institute for
Fiscal Studies

Structural Model Comparisons

Blundell and Shephard (2010)

Institute for
Fiscal Studies

A optimal tax design framework

- Assume earnings (and certain characteristics) are all that is observable to the tax authority

  – relax below to allow for 'partial' observability of hours

Social welfare, for individuals of type X

$$W = \sum_{w,X} \int_\varepsilon \int \Gamma(U(wh^* - T(w,h^*;X), h^*; X, \varepsilon))dF(\varepsilon)dG(w;X)$$

The tax structure $T(.)$ is chosen to maximise W, subject to:

$$\sum_{w,X} \int_\varepsilon \int T(wh^*, h^*; X)dF(\varepsilon)dG(w;X) = \overline{T}(=-R)$$

for a given R.

Control preference for equality by transformation function:

$$\Gamma(U \mid \theta) = \frac{1}{\theta}\left\{(\exp U)^{\theta} - 1\right\}$$
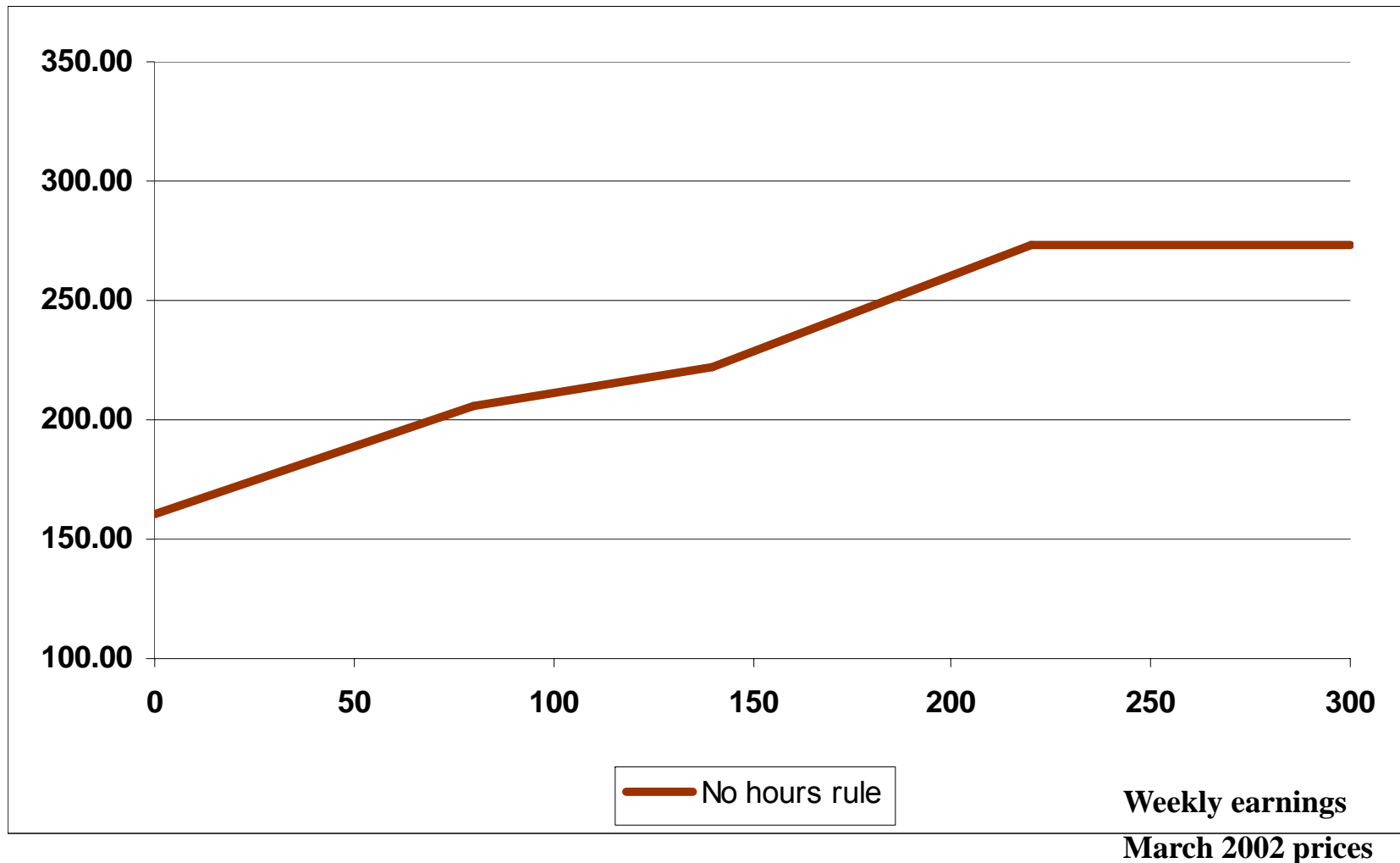
when θ is negative, the function favors the equality of utilities.

Define $\quad u(j) = u(c_j, h_j; X, \varepsilon).$

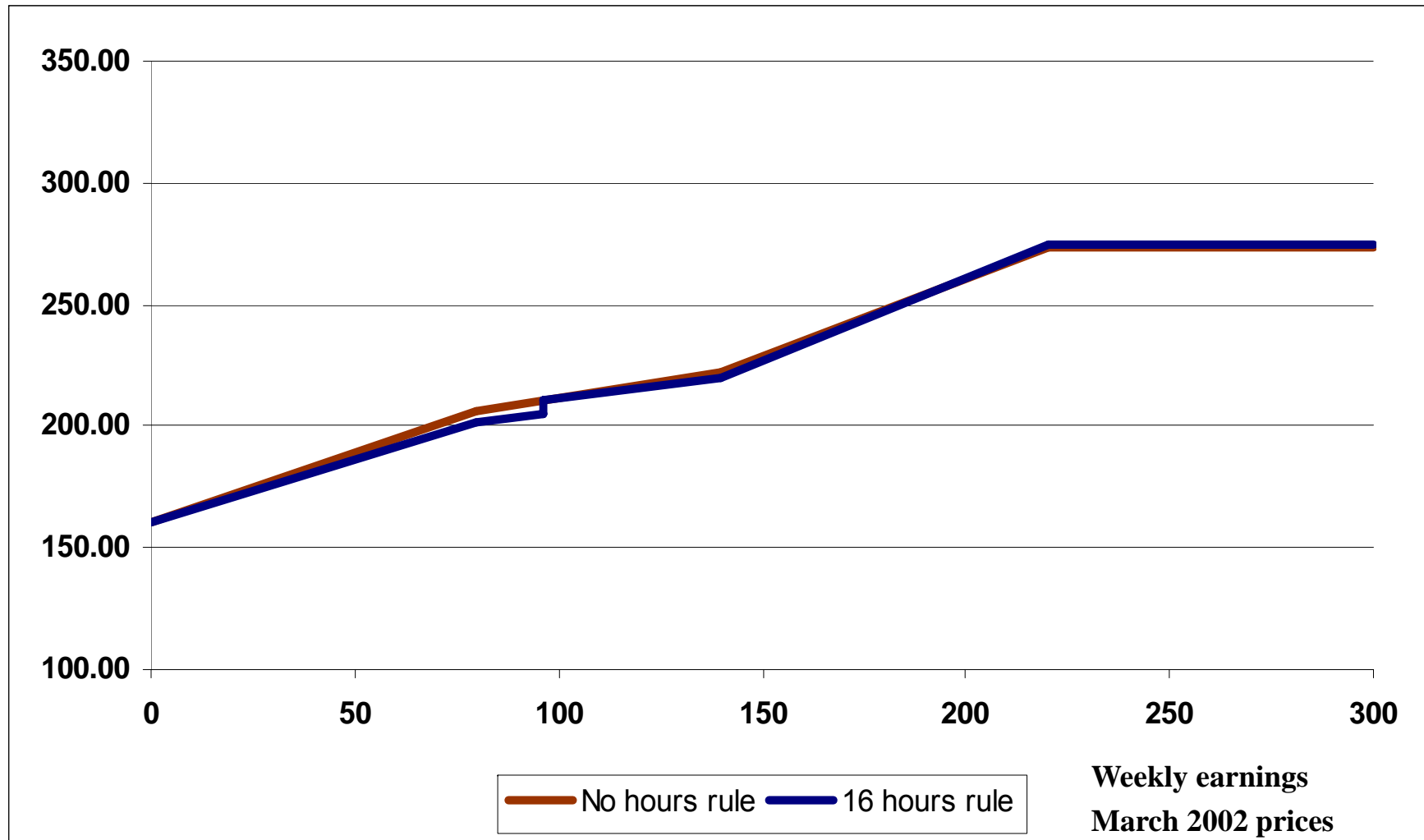If $\theta < 0$ then the integral over (Type I extreme-value) state specific errors is given by:

$$\frac{1}{\theta}\left[\Gamma(1 - \theta) \cdot (\exp u(j))^{\theta} - 1\right]$$

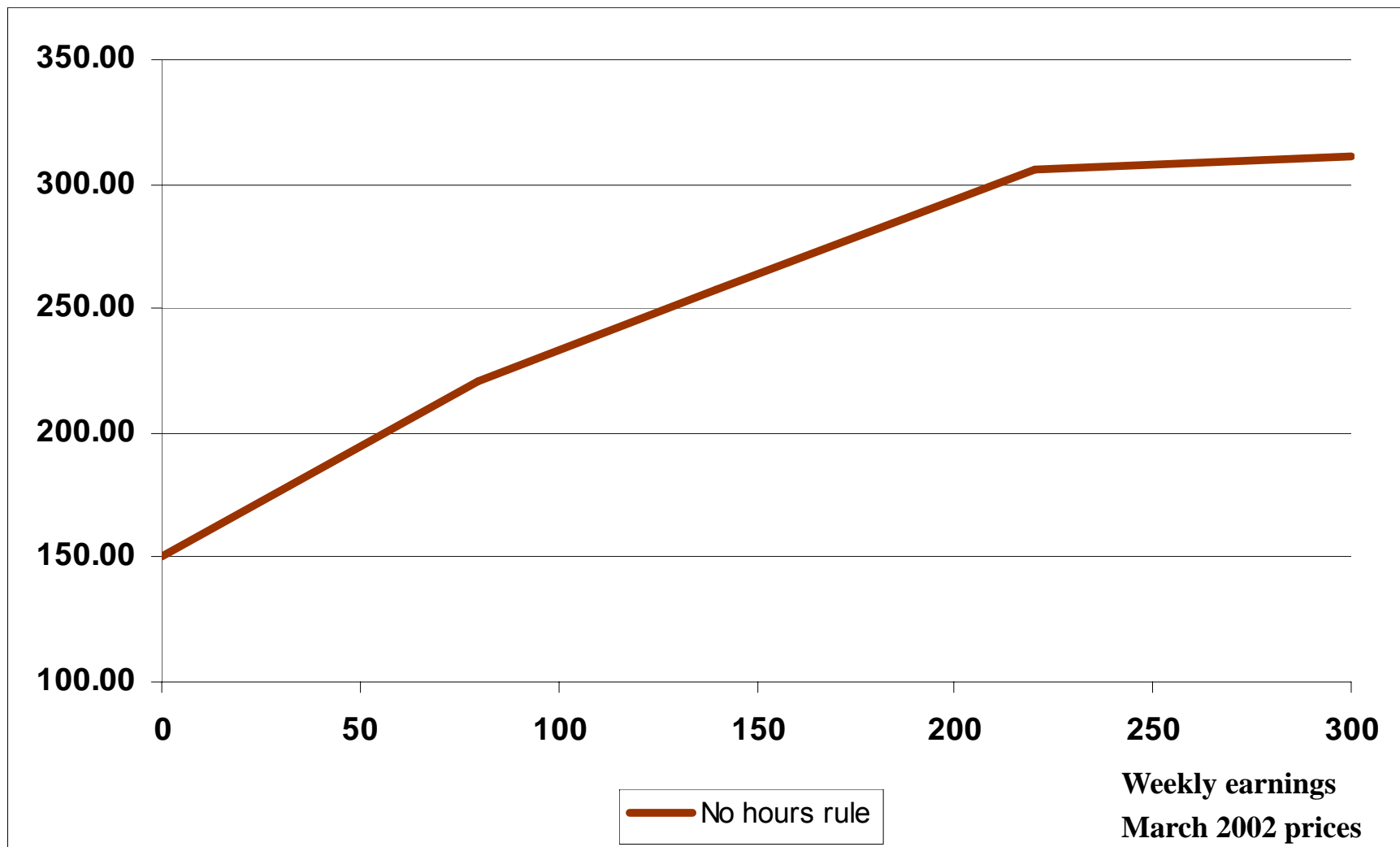# Implied Optimal Schedule, Youngest Child Aged 0-3

Weekly earnings
March 2002 prices

Blundell and Shephard (2010)

Institute for
Fiscal Studies

Implied Optimal Schedule, Youngest Child Aged 0-3

Blundell and Shephard (2010)

Institute for
Fiscal Studies

Implied Optimal Schedule, Youngest Child Aged 4-10

Blundell and Shephard (2010)

Institute for Fiscal Studies
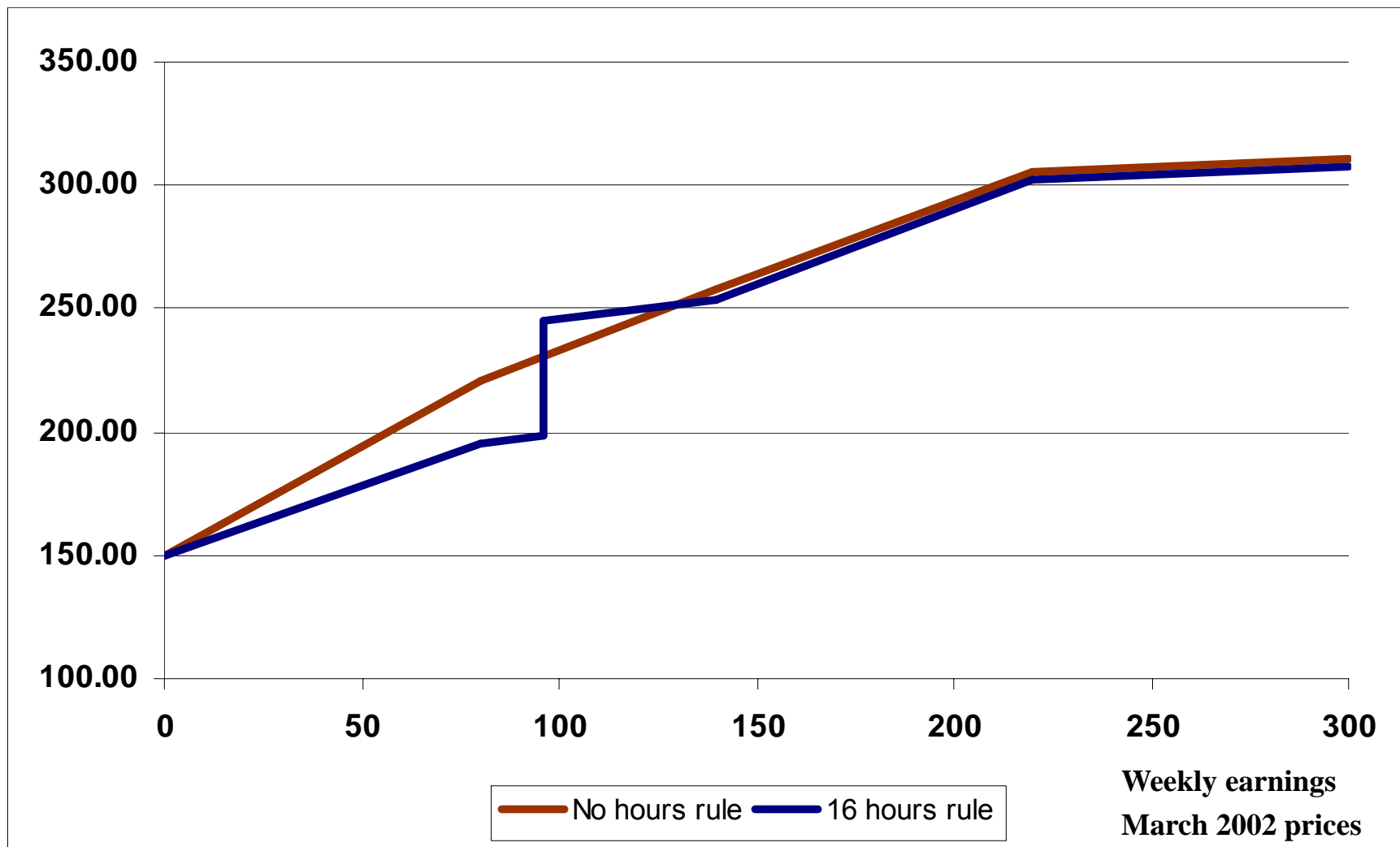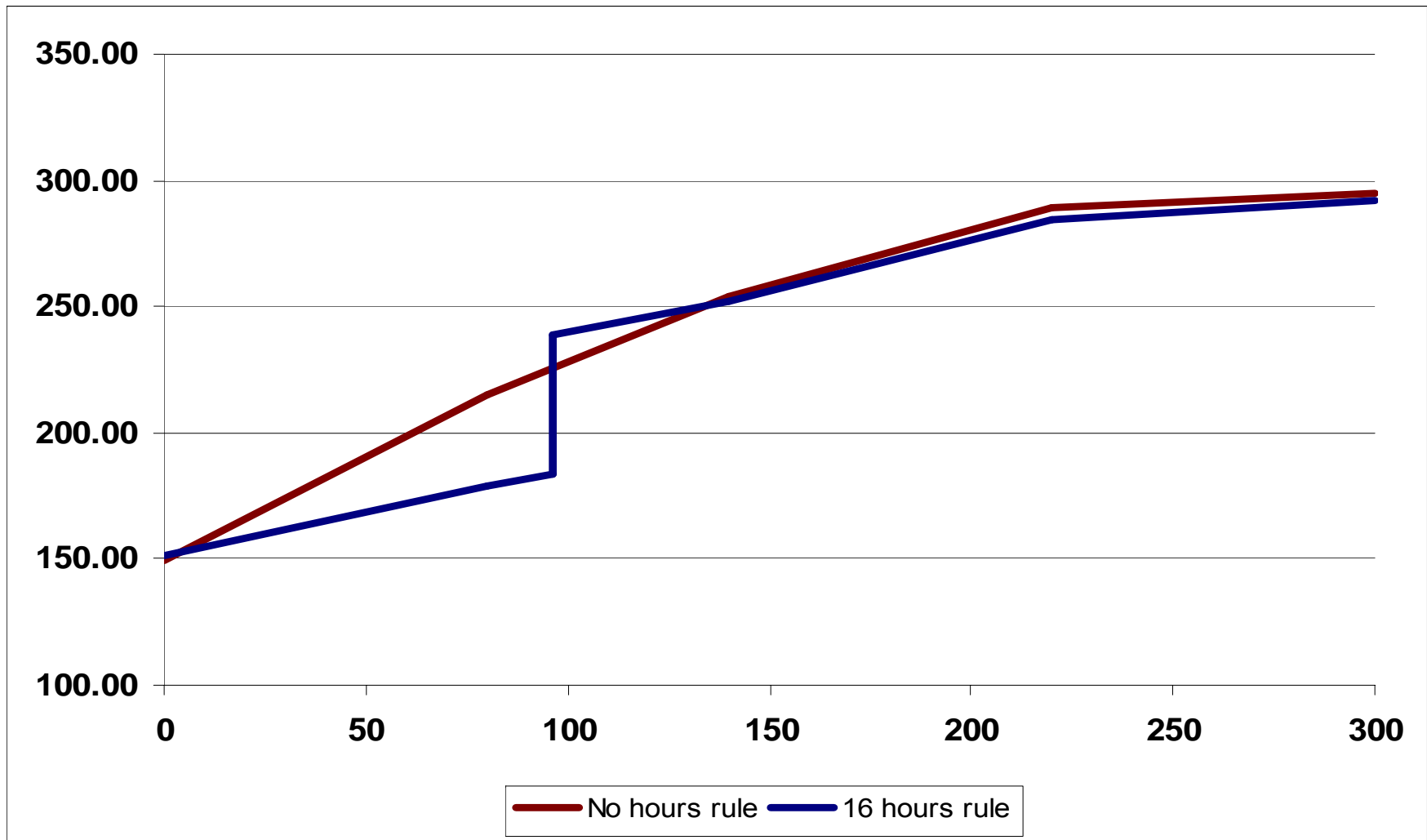
Implied Optimal Schedule, Youngest Child Aged 4-10

Blundell and Shephard (2010)
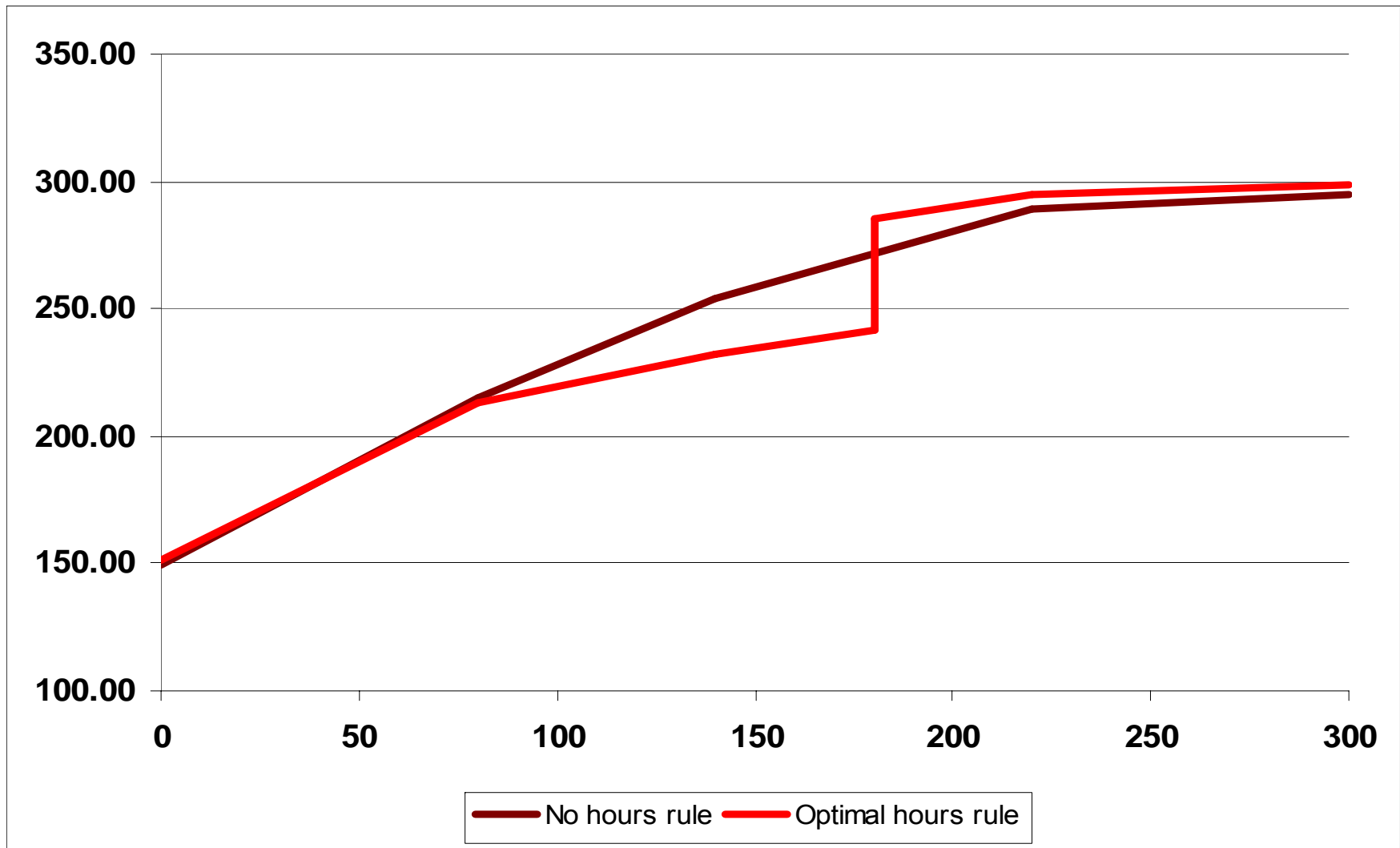
Implied Optimal Schedule, Youngest Child Aged 11-18

Chart showing optimal schedule curves. Y-axis ranges from 100.00 to 350.00. X-axis ranges from 0 to 300. Legend: "No hours rule" (dark red), "16 hours rule" (blue).

Blundell and Shephard (2010)

Implied Optimal Schedule, Youngest Child Aged 11-18

Blundell and Shephard (2010)

Institute for Fiscal Studies
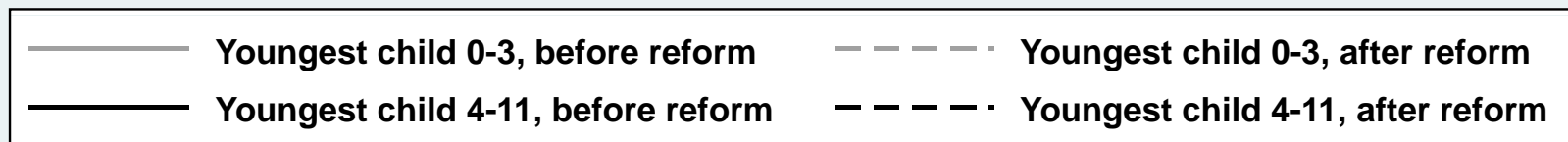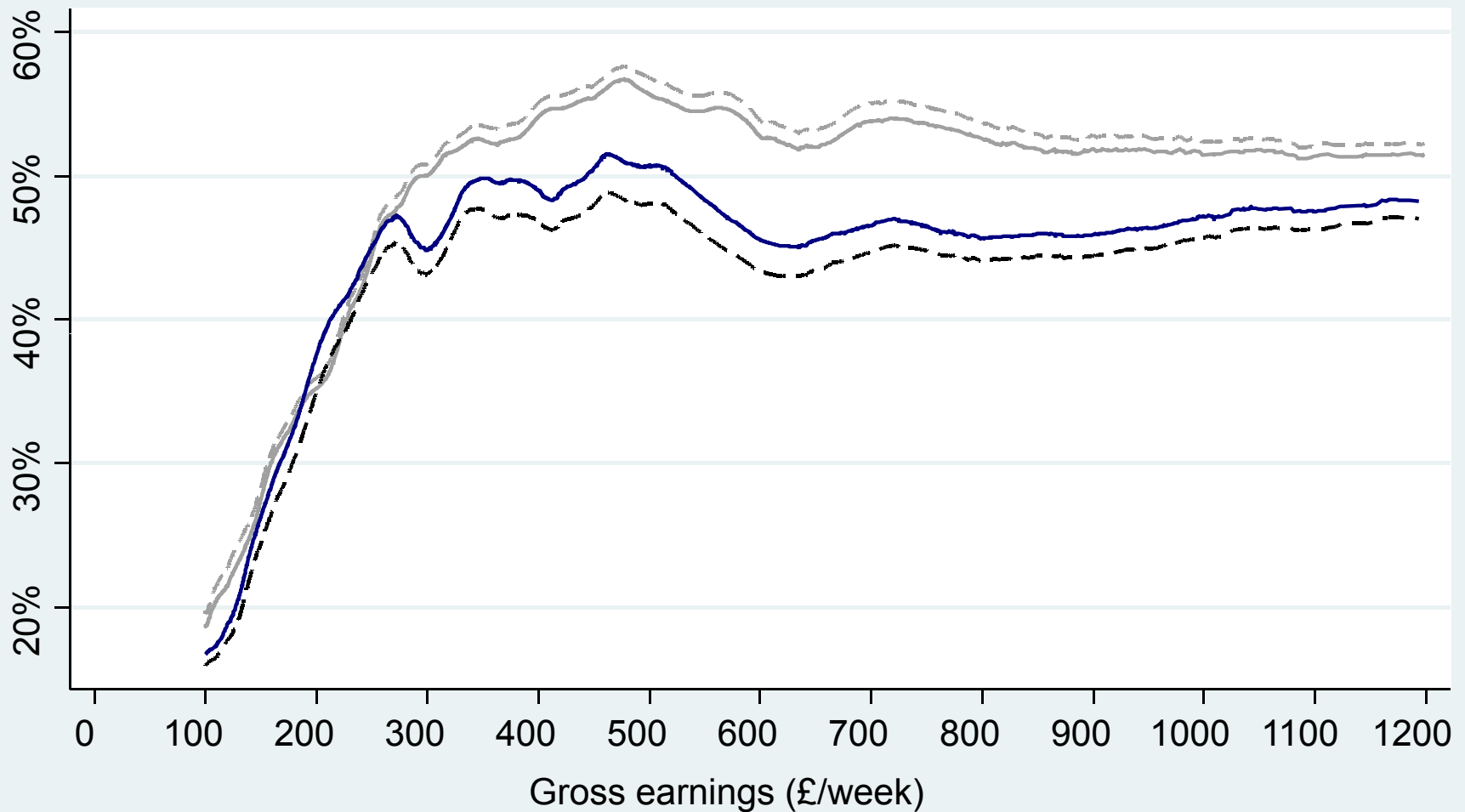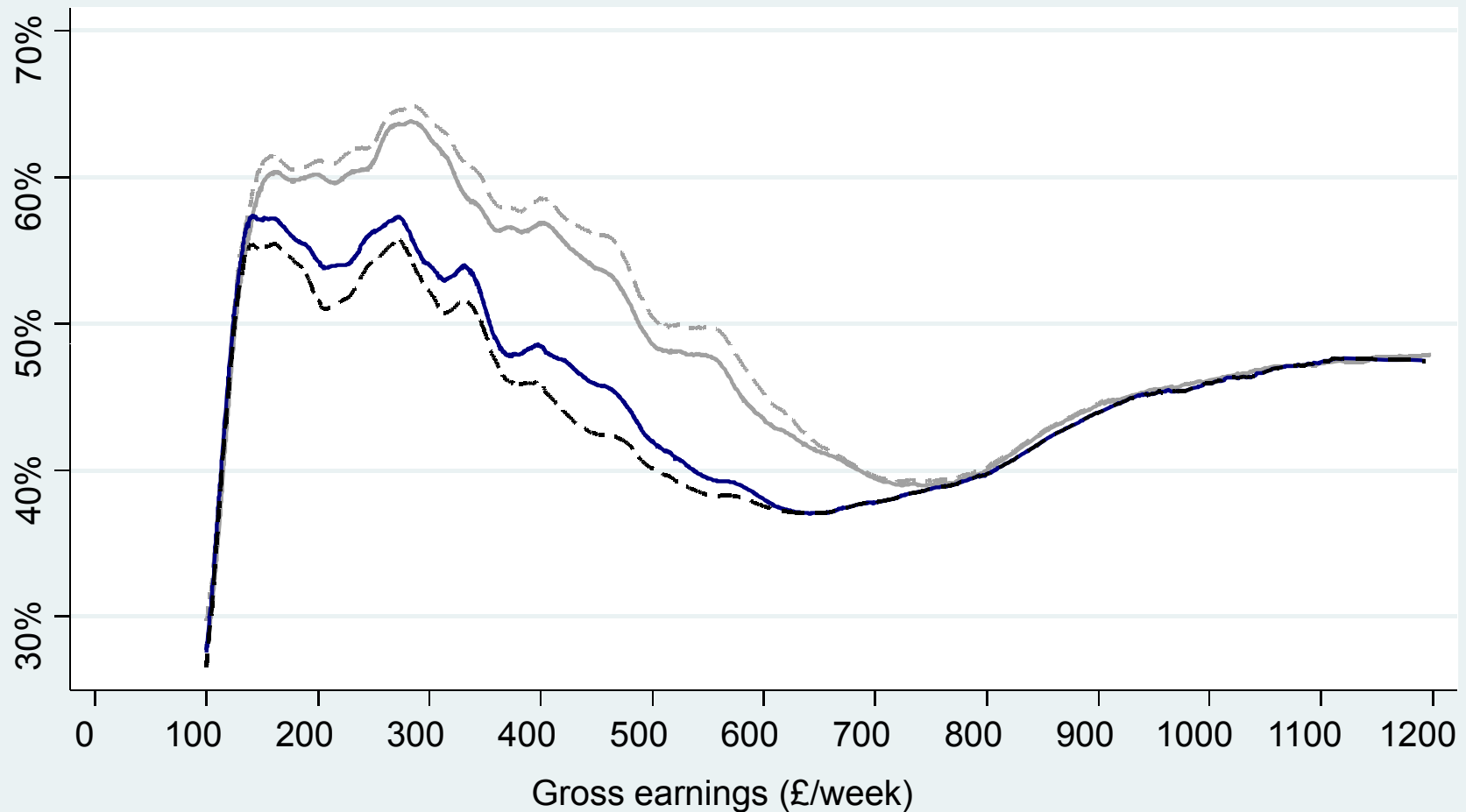
Implications for Tax Reform

- Change transfer/tax rate structure to match lessons from 'new' optimal tax analysis and empirical evidence:

- Lower marginal rates at the bottom

    - means-testing should be less aggressive

    - at least for some key groups =>

- Age-based taxation

    – distinguish by age of youngest child for mothers/parents

    – pre-retirement ages

- Hours rules? – at full time for older kids,

    – welfare gains depend on ability of tax authority to monitor hours

- Impact of reforms on PTRs and EMTRs (MRII) →

Effect of child age revenue neutral reforms on average PTRs across the earnings distribution, by age of youngest child

Legend:
- Youngest child 0-3, before reform
- Youngest child 0-3, after reform
- Youngest child 4-11, before reform
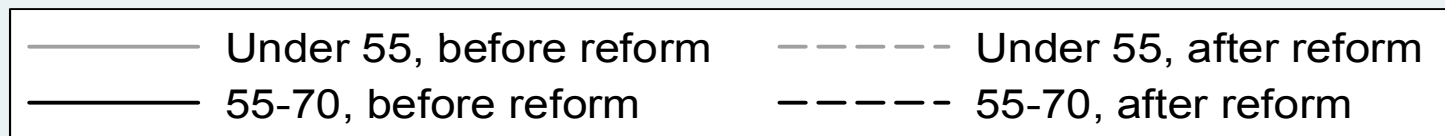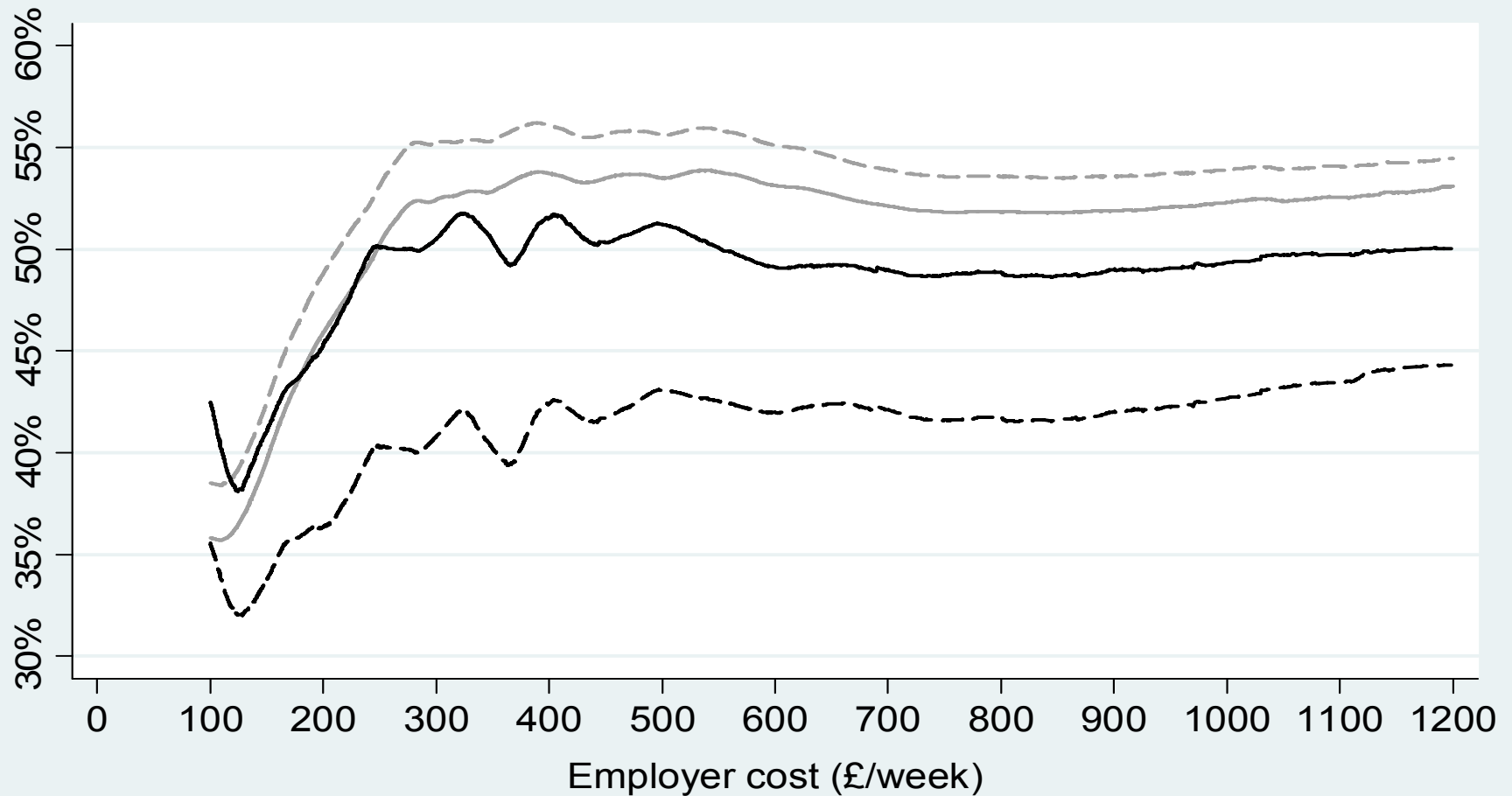- Youngest child 4-11, after reform

X-axis: Gross earnings (£/week)

Effect of child age revenue neutral reforms on average EMTRs across the earnings distribution, by age of youngest child

Gross earnings (£/week)

Youngest child 0-3, before reform — Youngest child 0-3, after reform
Youngest child 4-11, before reform — Youngest child 4-11, after reform

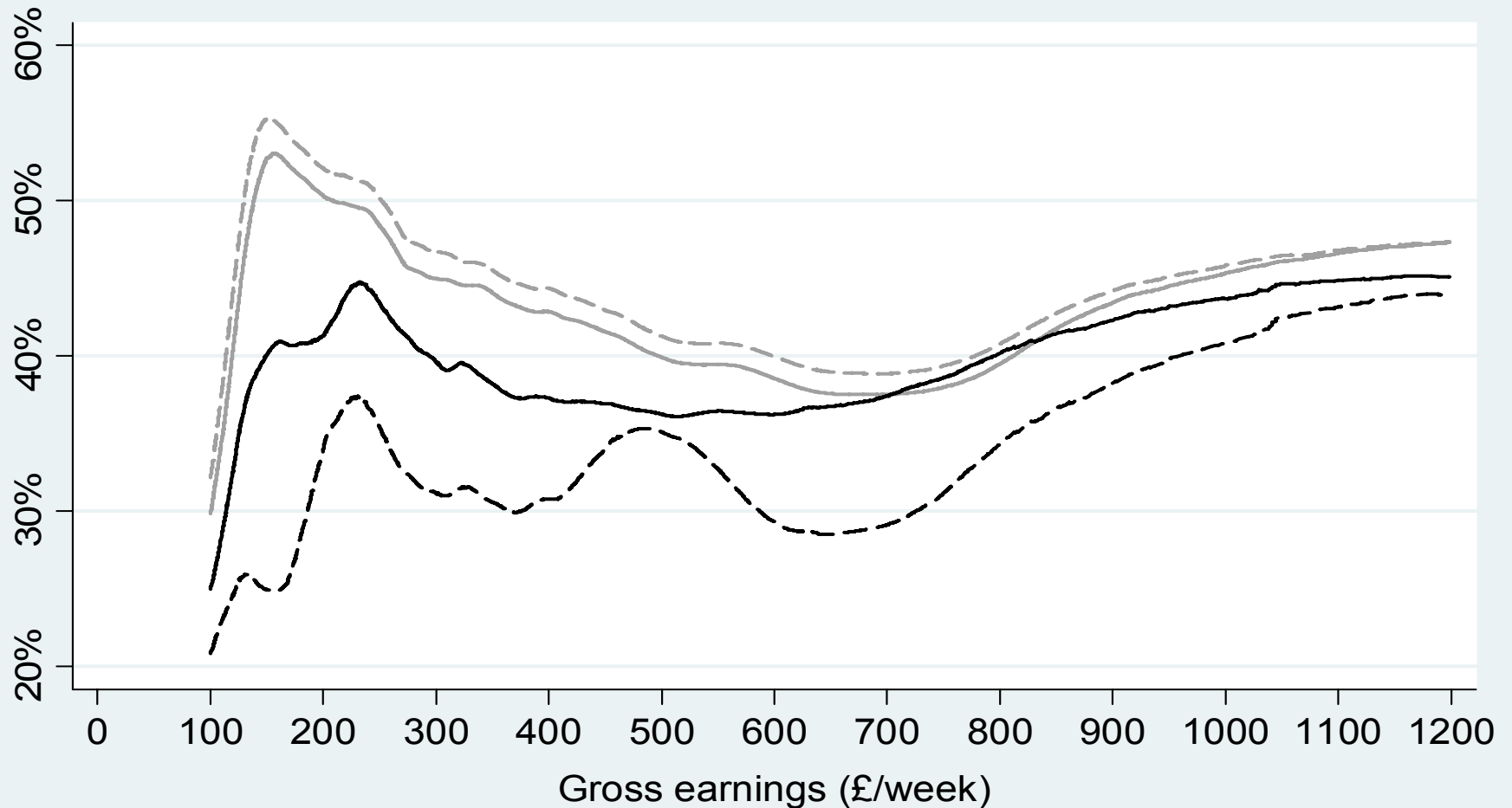# Effect of early retirement revenue neutral reforms on average PTRs across the earnings distribution, by age

Effect of early retirement revenue neutral reforms on average EMTRs across the earnings distribution, by age

Reforming Tax Rates

- Change transfer/tax rate structure to match lessons from 'new 'microeconometric' optimal tax' analysis

- lower marginal rates at the bottom

  - means-testing should be less aggressive

  - distinguish by age of youngest child

- The child-age tax reforms redistribute to families with younger children and involve a relatively large increase employment and aggregate earnings

- Age-based taxation

  - pre-retirement ages

  - important employment increases from age-based reforms

- Undo distributional effects of the rest of the package…

- For example, base broadening in the structure of VAT

Broadening the Base: Indirect Taxation

- Evidence on consumer behaviour => exceptions to uniformity
  - Childcare strongly complementary to paid work
  - Various other work/time related expenditures
    - conditional QUAIDS on FES, MRI
  - 'Vices': alcohol, tobacco, betting; also environmental externalities (three separate chapters in MRII)

- These do not line up well with existing structure of taxes
  $\Rightarrow$ Broadening the base – many zero rates in UK VAT

- Compensating losers, even on average, is difficult
  - Especially when we worry about work incentives too
  - Work with new set of direct tax and benefit instruments as in earnings tax reforms

Institute for Fiscal Studies

Indirect Taxation – UK case

Zero-rated:	Cost (£m)
Food	11,300
Construction of new dwellings	8,200
Domestic passenger transport	2,500
International passenger transport	150
Books, newspapers and magazines	1,700
Children's clothing	1,350
Drugs and medicines on prescription	1,350
Vehicles and other supplies to people with disabilities	350
Reduced-rated:	
Domestic fuel and power	2,950
Residential conversions and renovations	150
VAT-exempt:	
Rent on domestic dwellings	3,500
Rent on commercial properties	200
Finance and insurance	4,500

Institute for Fiscal Studies

Impact on budget share of an additional hour worked

Conditional on income and prices

Bread and Cereals	Negative
Meat and Fish	Negative
Dairy products	Negative
Tea and coffee	Negative
Fruit and vegetables	Negative
Food eaten out	Positive
Beer	Positive
Wine and spirits	Positive
Domestic fuels	Negative
Household goods and services	Positive
Adult clothing	Positive
Childrens' clothing	Negative
Petrol and diesel	Positive
Leisure goods and services	Positive

Source: QUAIDS on UK FES, MRI

Institute for
Fiscal Studies

Compensation and work incentives

- Changes in benefits, tax credits and tax rates and thresholds.

- Relatively easy to compensate for income losses but no so easy to do so in a way that minimises labour supply distortions

- Incorporate child age and age-based reforms

Institute for
Fiscal Studies

Effect of base broadening reform with earnings tax instruments as compensation (MRII), by income decile
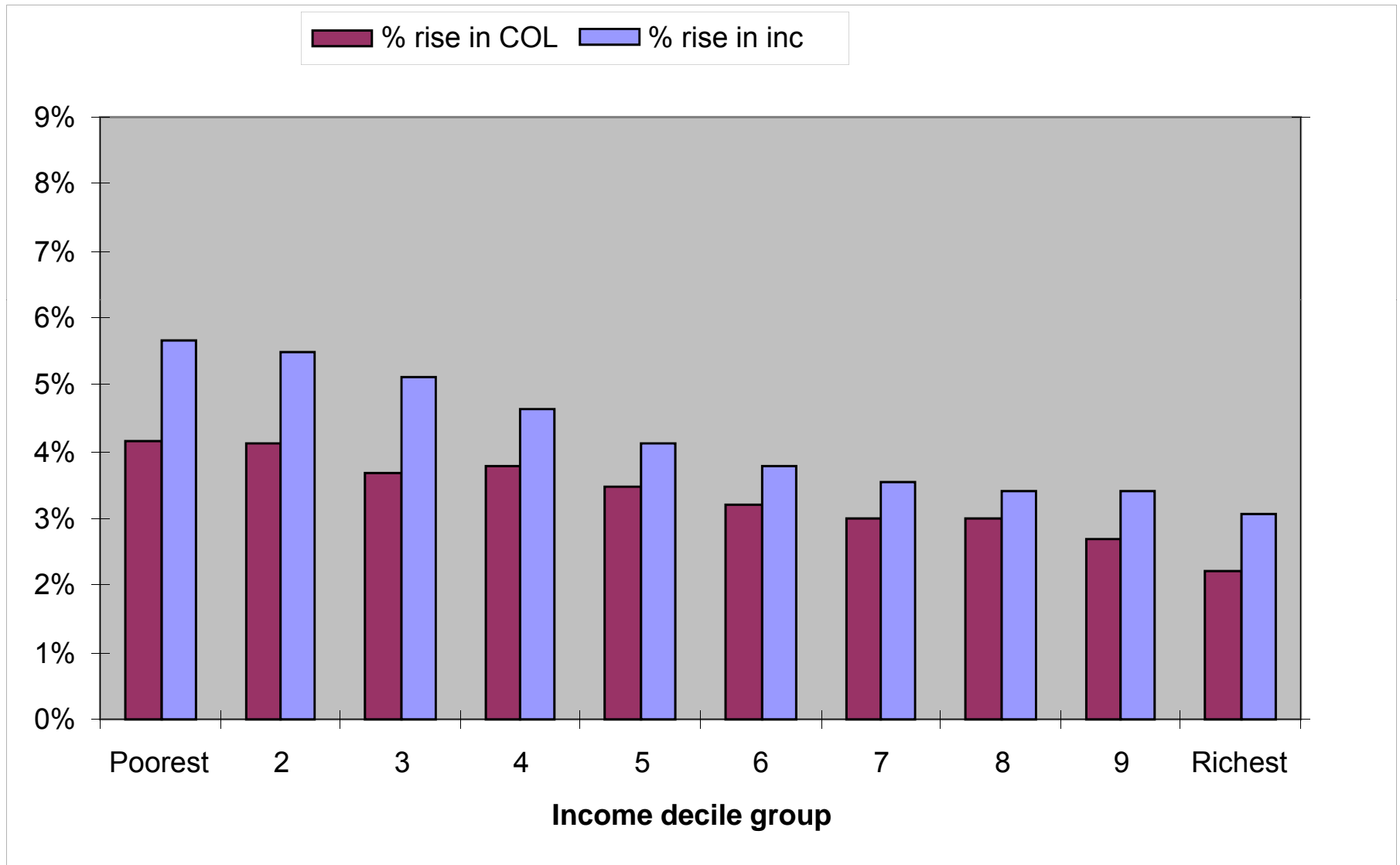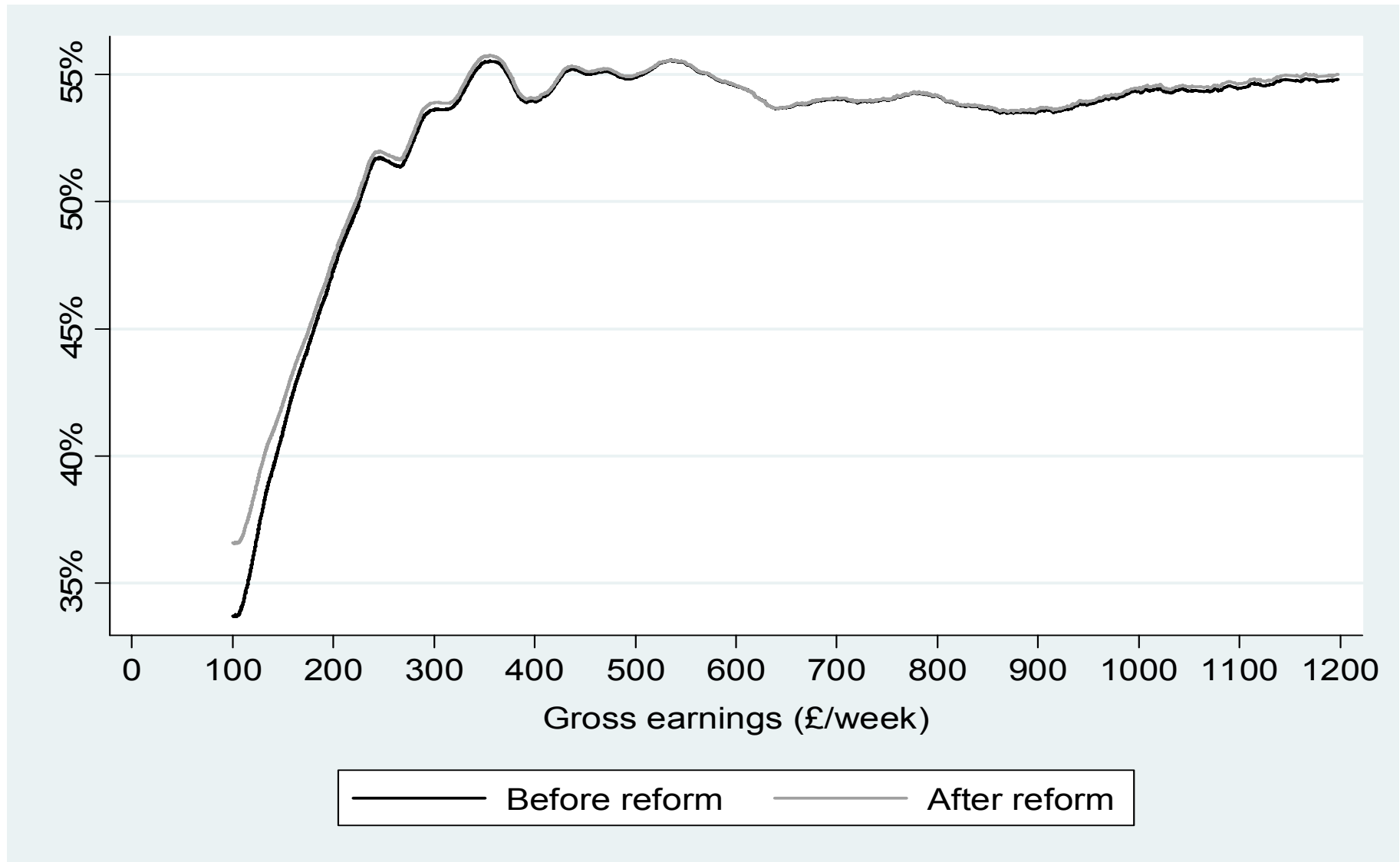
*R*eform revenue neutral and designed to leave effective tax rates on earnings unchanged
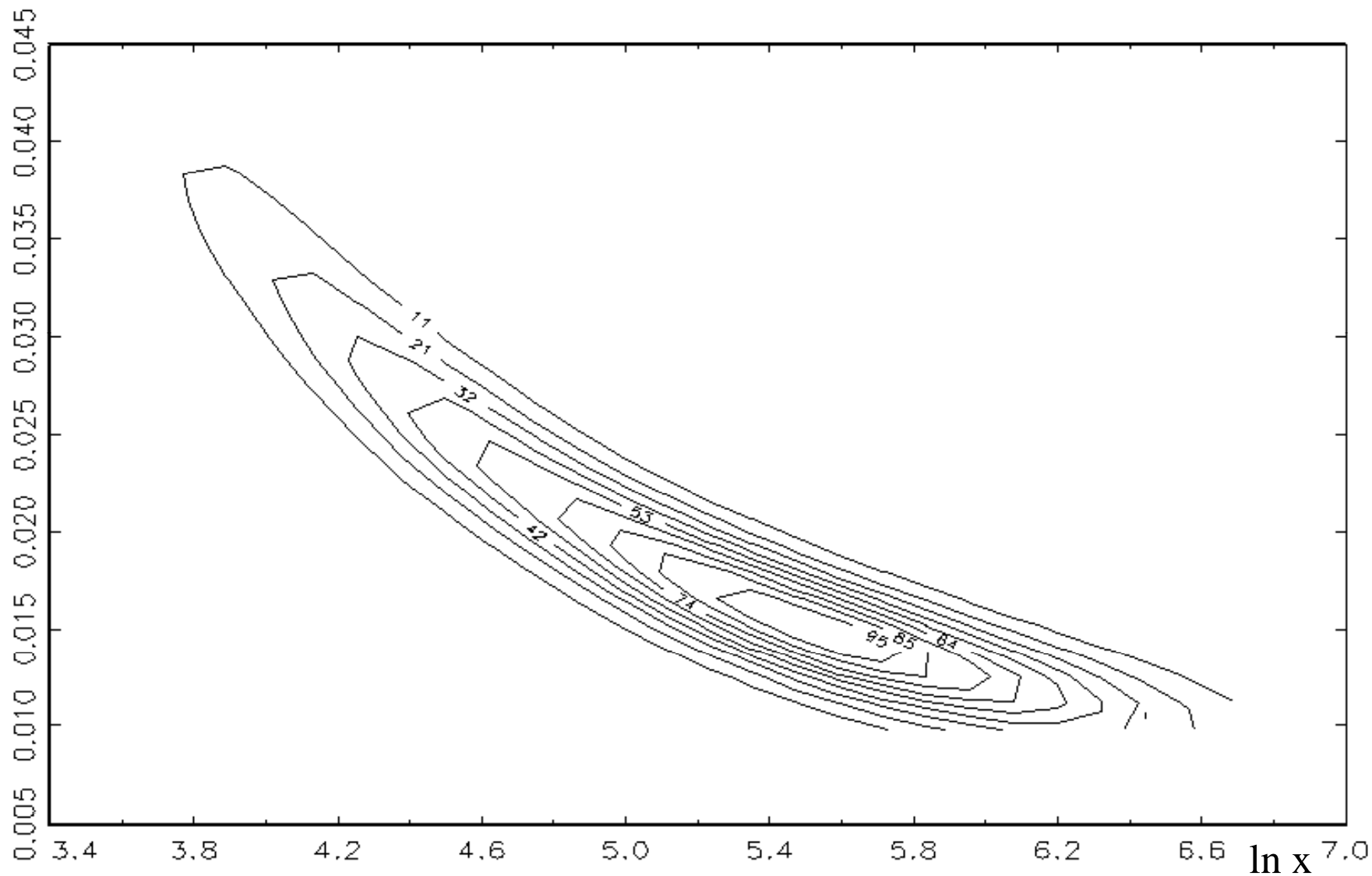## *EMTR:* before and after indirect tax reform
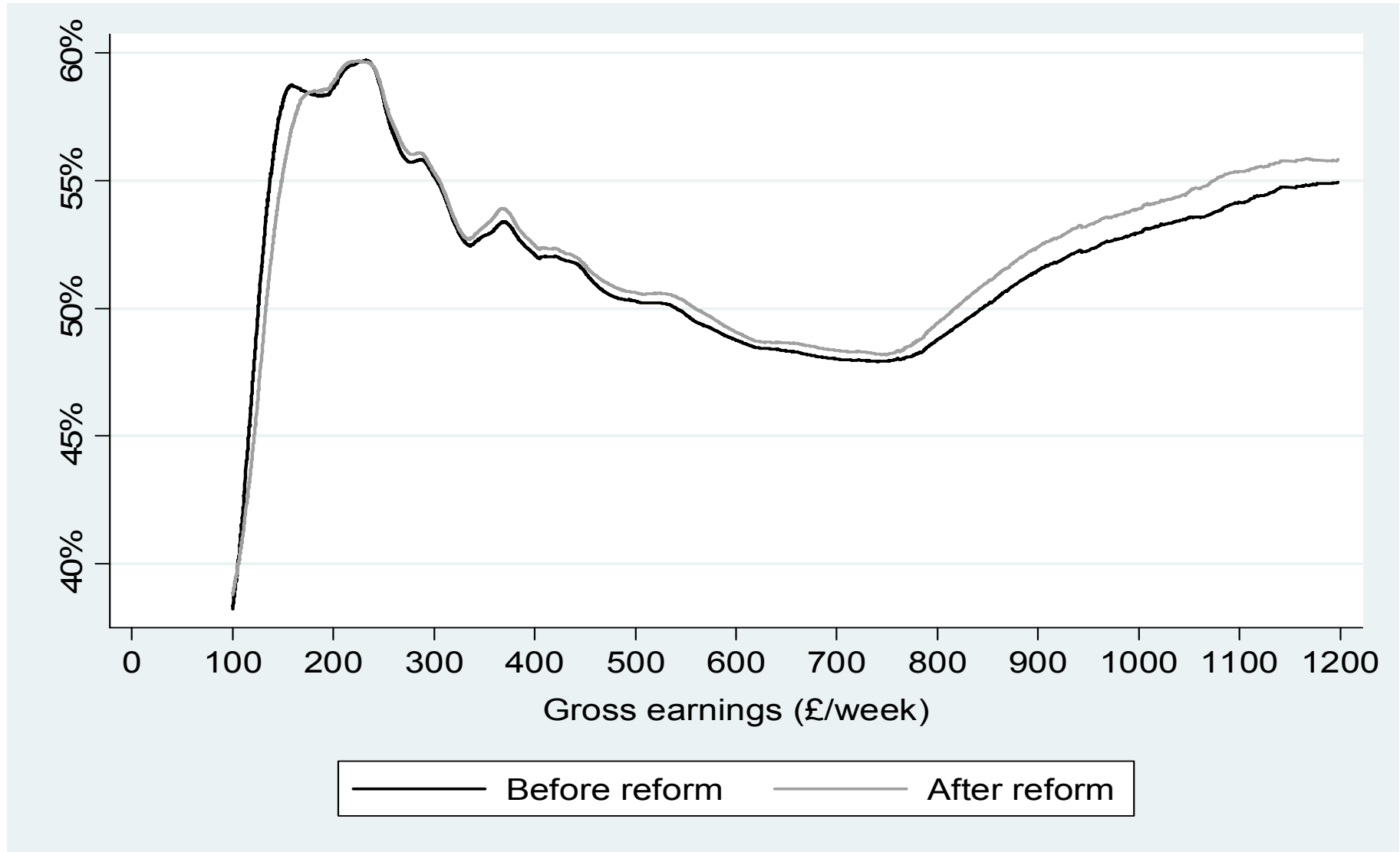
Reform revenue neutral and designed to leave effective tax rates on earnings unchanged
PTR: before and after indirect tax reform

Welfare gains - Distribution of EV/x by ln(x)

ln x

Source: MRII

Institute for
Fiscal Studies

(Some other) Key Margins of Adjustment

- Savings-pension-housing portfolio mix

  – 'Life-cycle' accumulation of savings and pension contributions

  – Expenditure tax treatment with certain 'behavioural' deviations and capturing all excess returns

- Forms of remuneration

  – CGT reforms and the non-alignment with labour income rates

  – Related to tax base and top tax rates

- Organisational form

  – UK chart on incorporations and tax reforms

- Look in the Review documents….

Institute for
Fiscal Studies

Top tax rates and taxable income elasticities

An 'optimal' top tax rate (Brewer, Saez and Shephard, MRI)
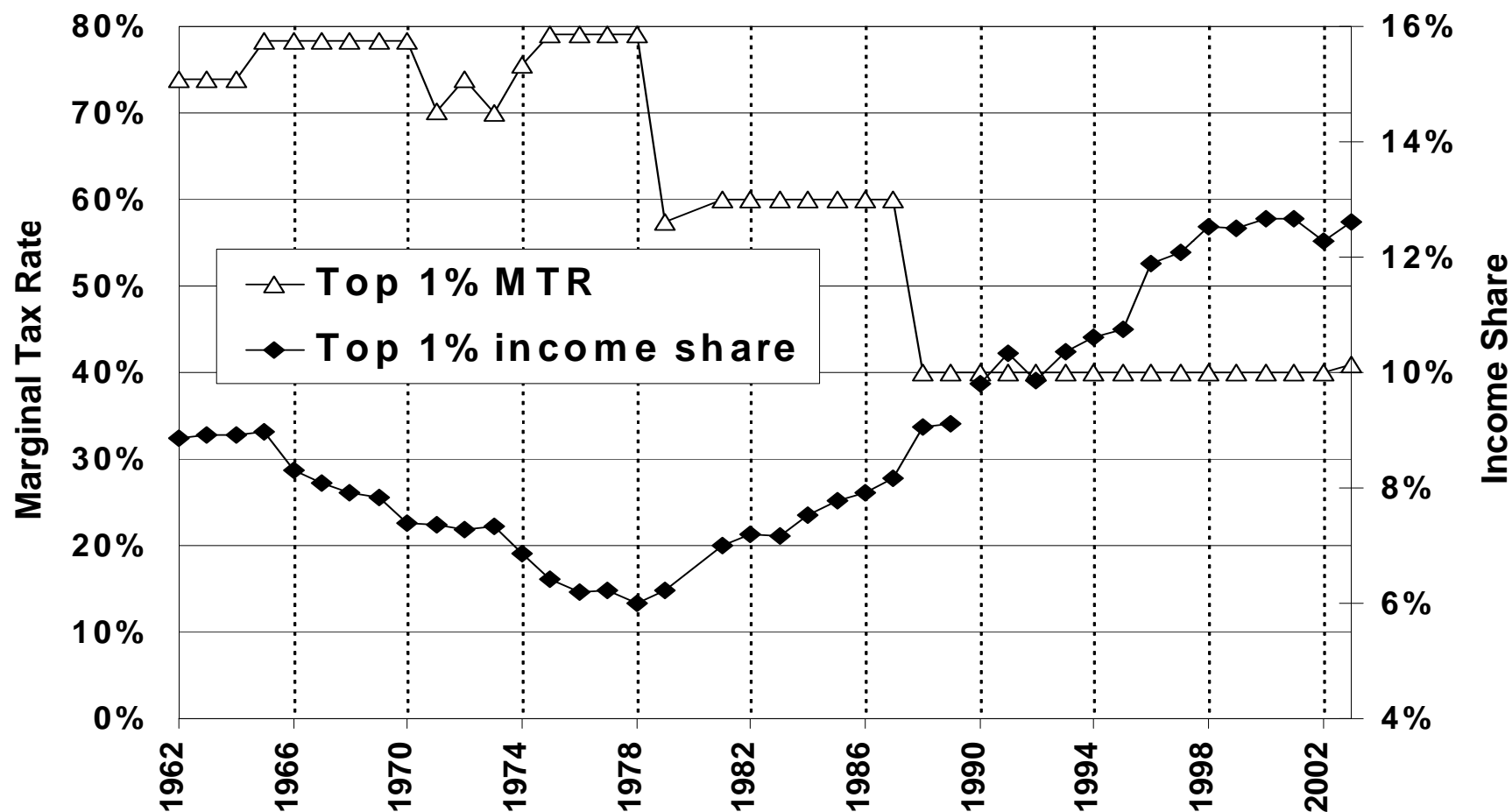
e – taxable income elasticity

$t = 1 / (1 + a \cdot e)$ where a is the Pareto parameter.

Estimate e from the evolution of top incomes in tax return data following large top MTR reductions in the 1980s

Estimate a (≈ 1.8) from the empirical distribution

Institute for
Fiscal Studies

Top incomes and taxable income elasticities

A. Top 1% Income Share and MTR, 1962-2003

Source: MR1, UK SPI (tax return data)

Institute for Fiscal Studies

Taxable Income Elasticities at the Top

	Simple Difference (top 1%)	DD using top 5-1% as control
1978 vs 1981	0.32	0.08
1986 vs 1989	0.38	0.41
1978 vs 1962	0.63	0.86
2003 vs 1978	0.89	0.64
Full time series	0.69	0.46
	(0.12)	(0.13)

With updated data the estimate remains in the .35 - .55 range with a central estimate of .46, but remain quite fragile

Note also the key relationship between the size of elasticity and the tax base (Slemrod and Kopczuk, 2002)

Institute for Fiscal Studies

Pareto distribution as an approximation to the income distribution
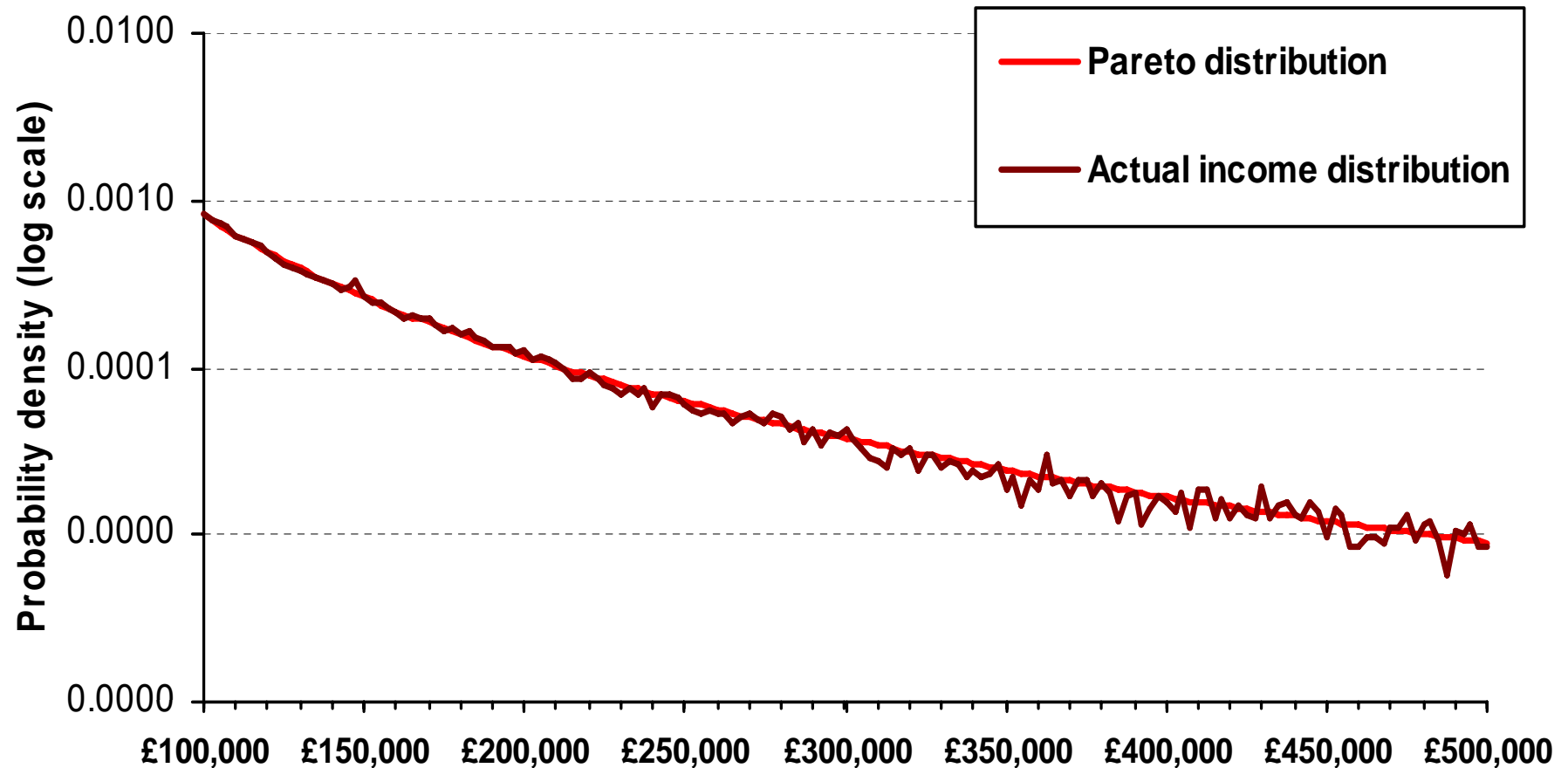
Pareto parameter quite accurately estimated at 1.8
=> revenue maximising tax rate for top 1% of 55%.

Empirical Evidence and Tax Policy Design:
Lessons from the Mirrlees Review

Five building blocks for the role of evidence in tax design….

- Key margins of adjustment to tax reform

- Measurement of effective tax rates

- The importance of information, complexity and salience

- Evidence on the size of responses

- Implications for tax design

see
http://www.ifs.org.uk/mirrleesReview

Institute for
Fiscal Studies

But (too) many key issues unresolved, and with little evidence base (!)

Including:

- Tax credits and earnings progression

- Distinction between dynamic and static policies

- Human capital investment bias and savings taxation

- Taxation of financial services

- Some transition issues and capitalisation

- ….

Institute for
Fiscal Studies

Dynamic effects on wages for low income welfare recipients?

SSP: Hourly wages by months after RA
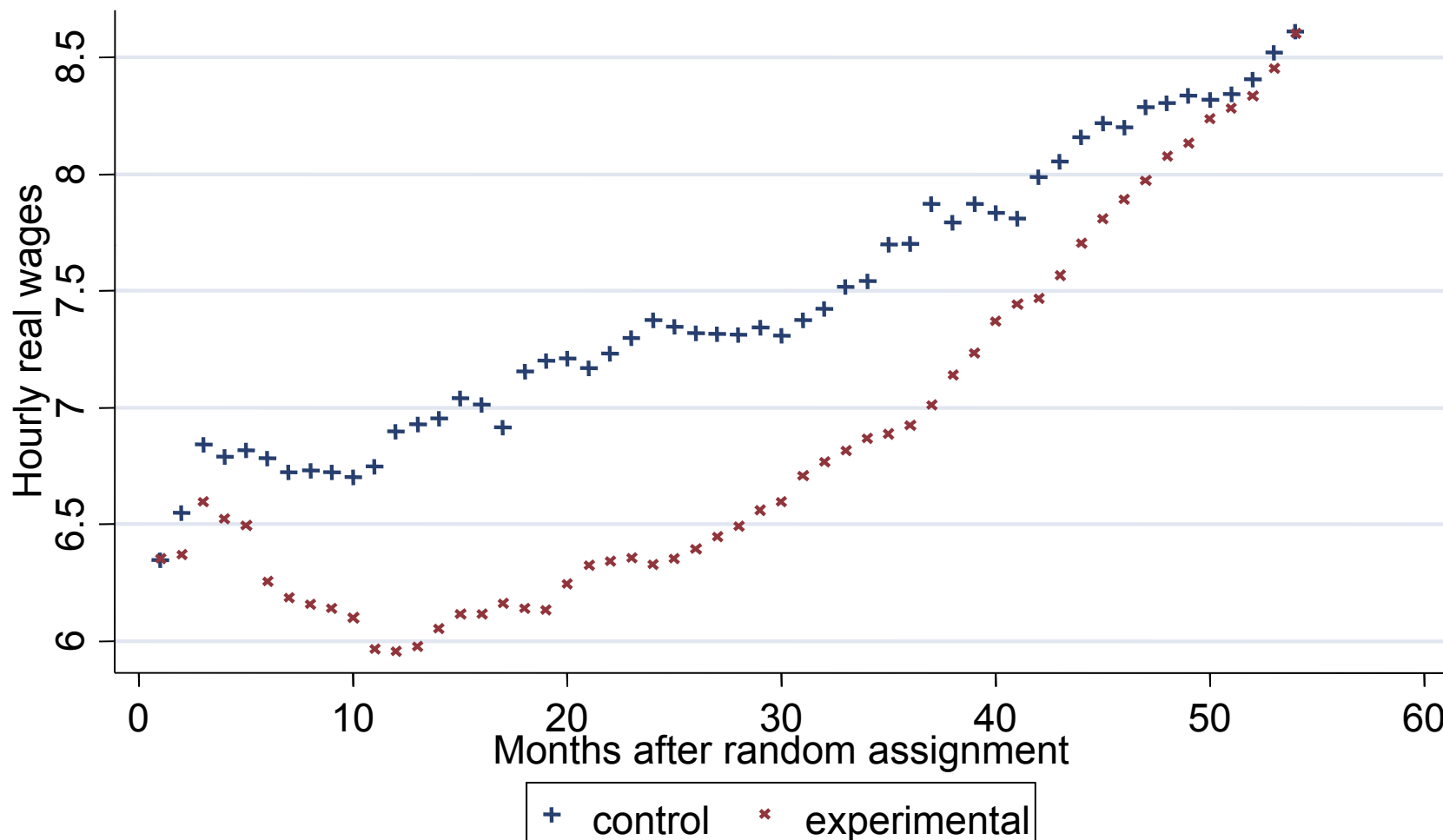
SSP: Monthly earnings by months after RA
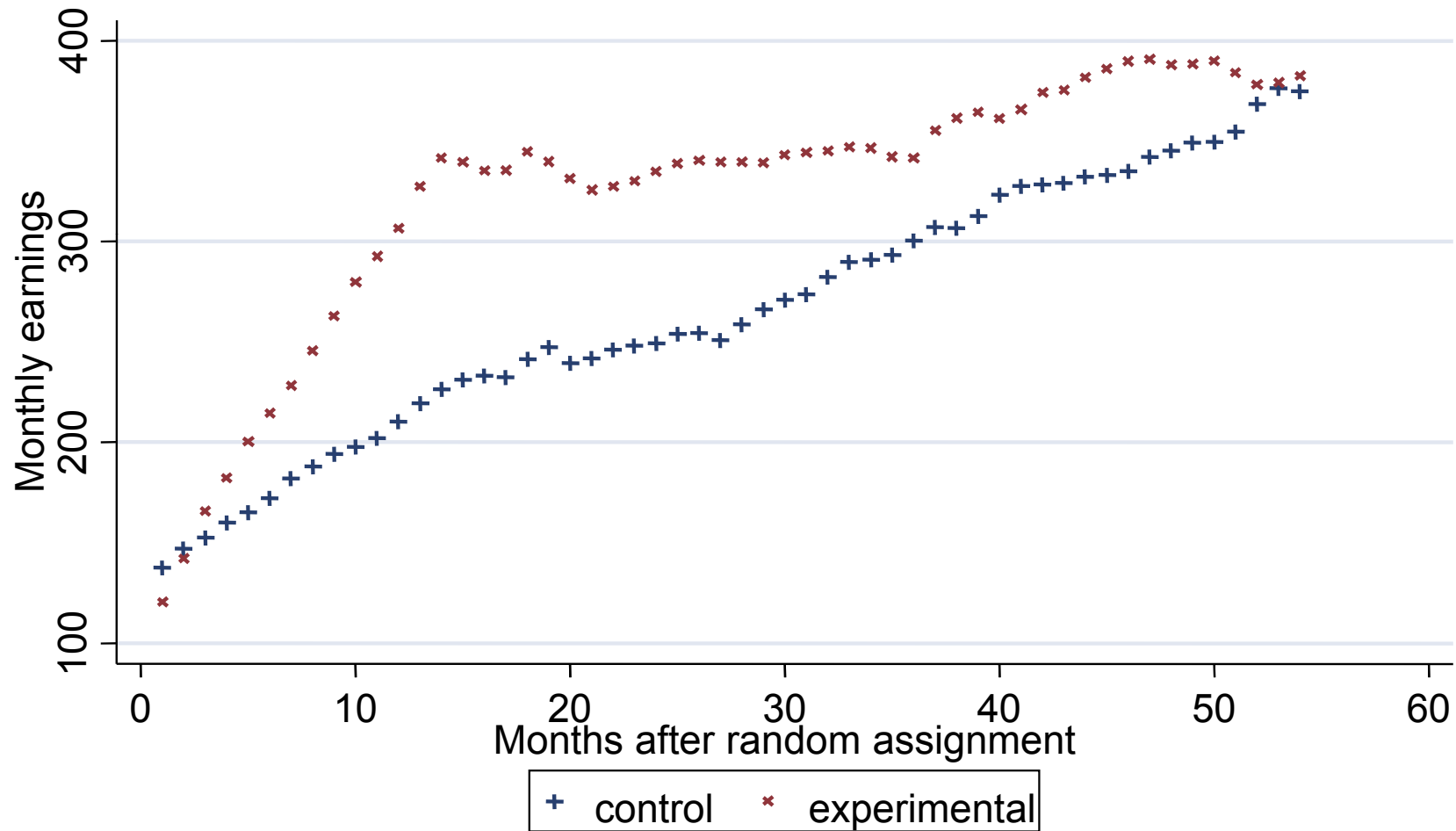
Evidence from the SSP experiment

- Earnings and employment line up with control group after time limit is exhausted

- Little evidence of employment enhancement or wage progression

- Other evidence, Taber etc, show some progression but quite small

- Remains a key area of research

Institute for
Fiscal Studies

Some Additional References:

Banks, J., Blundell, R., and Tanner, S. (1998) "Is there a retirement-savings puzzle?", *American Economic Review*, 88, 769 – 788.

Besley, T. and S. Coate (1992), "Workfare versus Welfare: Incentive Arguments for Work Requirement in Poverty Alleviation Programs", *American Economic Review*, 82(1), 249-261.

Blundell, R. (2006), "Earned income tax credit policies: Impact and Optimality", The 2005 Adam Smith Lecture, *Labour Economics*, 13, 423-443.

Blundell, R.W., Duncan, A. and Meghir, C. (1998), "Estimating Labour Supply Responses using Tax Policy Reforms", *Econometrica*, 66, 827-861.

Blundell, R, Duncan, A, McCrae, J and Meghir, C. (2000), "The Labour Market Impact of the Working Families' Tax Credit", *Fiscal Studies*, 21(1).

Blundell, R. and Hoynes, H. (2004), "In-Work Benefit Reform and the Labour Market", in Richard Blundell, David Card and Richard .B. Freeman (eds) *Seeking a Premier League Economy*. Chicago: University of Chicago Press.

Blundell, R. and MaCurdy (1999), "Labour Supply: A Review of Alternative Approaches", in Ashenfelter and Card (eds), *Handbook of Labour Economics*, Elsevier North-Holland.

Institute for
Fiscal Studies

Blundell, R., Meghir, C., and Smith, S. (2002), 'Pension incentives and the pattern of early retirement', *Economic Journal*, 112, C153–70.

Blundell, R., and A. Shephard (2008), 'Employment, hours of work and the optimal taxation of low income families', IFS Working Papers , W08/01

Brewer, M. A. Duncan, A. Shephard, M-J Suárez, (2006), "Did the Working Families Tax Credit Work?", *Labour Economics*, 13(6), 699-720.

Card, David and Philip K. Robins (1998), "Do Financial Incentives Encourage Welfare Recipients To Work?", *Research in Labor Economics*, 17, pp 1-56.

Chetty, R. (2008), 'Sufficient statistics for welfare analysis: a bridge between structural and reduced-form methods', National Bureau of Economic Research (NBER), Working Paper 14399

Diamond, P. (1980): "Income Taxation with Fixed Hours of Work," *Journal of Public Economics*, 13, 101-110.

Eissa, Nada and Jeffrey Liebman (1996), "Labor Supply Response to the Earned Income Tax Credit", *Quarterly Journal of Economics*, CXI, 605-637.

Immervoll, H. Kleven, H. Kreiner, C, and Saez, E. (2005), `Welfare Reform in European Countries: A Micro-Simulation Analysis' *Economic Journal*.

Institute for
Fiscal Studies

Keane, M.P. and Moffitt, R. (1998), "A Structural Model of Multiple Welfare Program Participation and Labor Supply", *International Economic Review*, 39(3), 553-589.

Kopczuk, W. (2005), '[Tax bases, tax rates and the elasticity of reported income](#)', *[Journal of Public Economics](#)*, 89, 2093–119.

Laroque, G. (2005), "Income Maintenance and Labour Force Participation", *Econometrica,* 73(2), 341-376.

Mirrlees, J.A. (1971), "The Theory of Optimal Income Taxation", *Review of Economic Studies*, 38, 175-208.

Moffitt, R. (1983), "An Economic Model of Welfare Stigma", *American Economic Review*, 73(5), 1023-1035.

Phelps, E.S. (1994), "Raising the Employment and Pay for the Working Poor", *American Economic Review*, 84 (2), 54-58.

Saez, E. (2002): "Optimal Income Transfer Programs: Intensive versus Extensive Labor Supply Responses," *Quarterly Journal of Economics*, 117, 1039-1073.

Sørensen , P. B. (2009) "Dual income taxes: a Nordic tax system", Paper prepared for the conference on *New Zealand Tax Reform – Where to Next?.*

Institute for Fiscal Studies