

# Empirical Evidence and Tax Reform: Lessons from the Mirrlees Review

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## Layout

- I. Background to the Mirrlees Review
- II. Earnings Taxation
- III. Taxation of Consumption and Savings
- <http://www.ifs.org.uk/mirrleesReview>

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## I. Background to the Mirrlees Review

- Built on a large body of economic theory and evidence.
- Inspired by the Meade Report on Taxation
- Review of tax design from first principles
  - for modern open economies in general
  - for the UK in particular
- Commissioned papers on key topics, with commentaries, collected in *Dimensions of Tax Design*.
- Received submissions and held discussions with some tax experts.



# The Mirrlees Review

- Two volumes:
  - 'Dimensions of Tax Design': published April 2010
  - a set of 13 chapters on particular areas by IFS researchers + international experts, along with expert commentaries (MRI)
  - 'Tax by Design': published Nov 2010
    - an integrated picture of tax design and reform, written by the editors (MRII)
- <http://www.ifs.org.uk/mirrleesReview>

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

### Editorial Team

*Chairman:* Sir James Mirrlees

Tim Besley (LSE, Bank of England & IFS)

Richard Blundell (IFS & UCL)

Malcolm Gammie QC (One Essex Court & IFS)

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with:

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Robert Chote (IFS)

Paul Johnson (IFS & Frontier)

Gareth Myles (Exeter & IFS)

## *Dimensions of Tax Design: commissioned chapters and expert commentaries*

- 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*

## *Dimensions of Tax Design: commissioned chapters and expert commentaries*

- 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*

## We started from a structure of taxes and benefits that..

- Does not work as a system
  - Lack of joining up between welfare benefits, personal taxes and corporate taxes,...
- Is not neutral where it should be
  - Inconsistent savings taxes and a corporate tax system that favours debt over equity,...
- Is not well designed where it should deviate from neutrality
  - A mass of different tax rates on carbon and failure to price congestion properly,...
- Does not achieve progressivity efficiently
  - VAT zero and reduced rating a poor way to redistribute, and taxes and benefits damage work incentives more than necessary

- Focus here on taxation of earnings, with some discussion of indirect taxation and taxation of savings:
  - 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

- Consider 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 and complexity
4. Evidence on the size of responses
5. Implications from theory for tax design

## Draw on new empirical evidence: – 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
  - interaction with labour supply and variation of price elasticities
- Intertemporal behaviour
  - consumption, savings and pensions
  - persistence and magnitude of earnings shocks over the life-cycle
- Ability to (micro-)simulate marginal and average rates
  - simulate potential reforms

## II. Earnings Taxation

- This section will analyse the context, the impact and the design of earnings tax reforms
- It will focus on two questions:
  - How should we measure the impact of taxation on work decisions and earnings?
  - How should we assess the optimality of tax reforms?
- Sub-heading: *Labor Supply Responses at the Extensive Margin: What Do We Know and Why Does It Matter?*
- Key chapter (in Mirrlees Review): Brewer, Saez and Shephard, <http://www.ifs.org.uk/mirrleesReview>
- + commentaries by Moffitt, Laroque and Hoynes

### Draw on new empirical evidence: – some examples

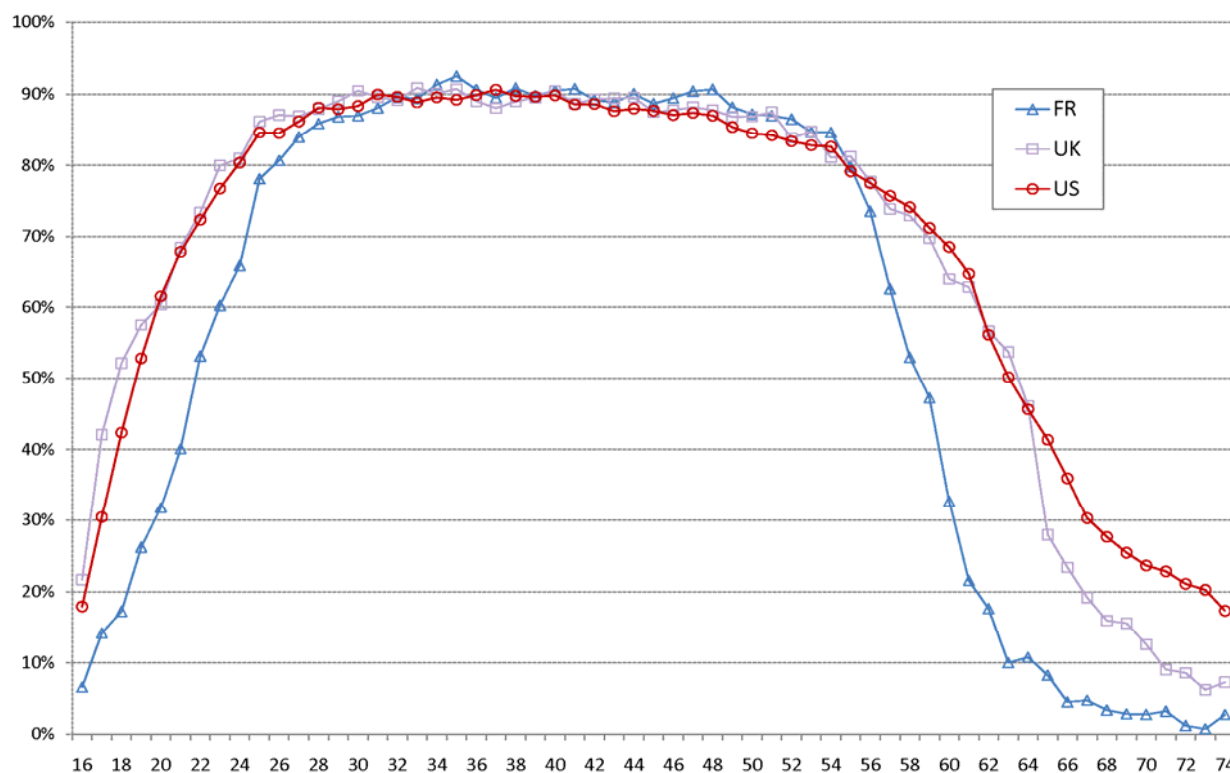
- labour supply responses for individuals and families
  - at the intensive and extensive margins
  - by age and demographic structure
- taxable income elasticities
  - top of the income distribution using tax return information
- income uncertainty
  - persistence and magnitude of earnings shocks over the life-cycle
- ability to (micro-)simulate marginal and average rates
  - simulate reforms

## The extensive – intensive distinction is important for a number of reasons:

- Understanding responses to tax and welfare reform
  - Jim Heckman, David Wise, Ed Prescott, etc.. all highlight the importance of extensive labour supply margin,
  - a balance needs to be struck between the two margins....
- The size of extensive and intensive responses are also key parameters in the recent literature on earnings tax design
  - used heavily in the Review.
- But the relative importance of the extensive margin is specific to particular groups
  - I'll examine a specific case of low earning families in more detail in what follows

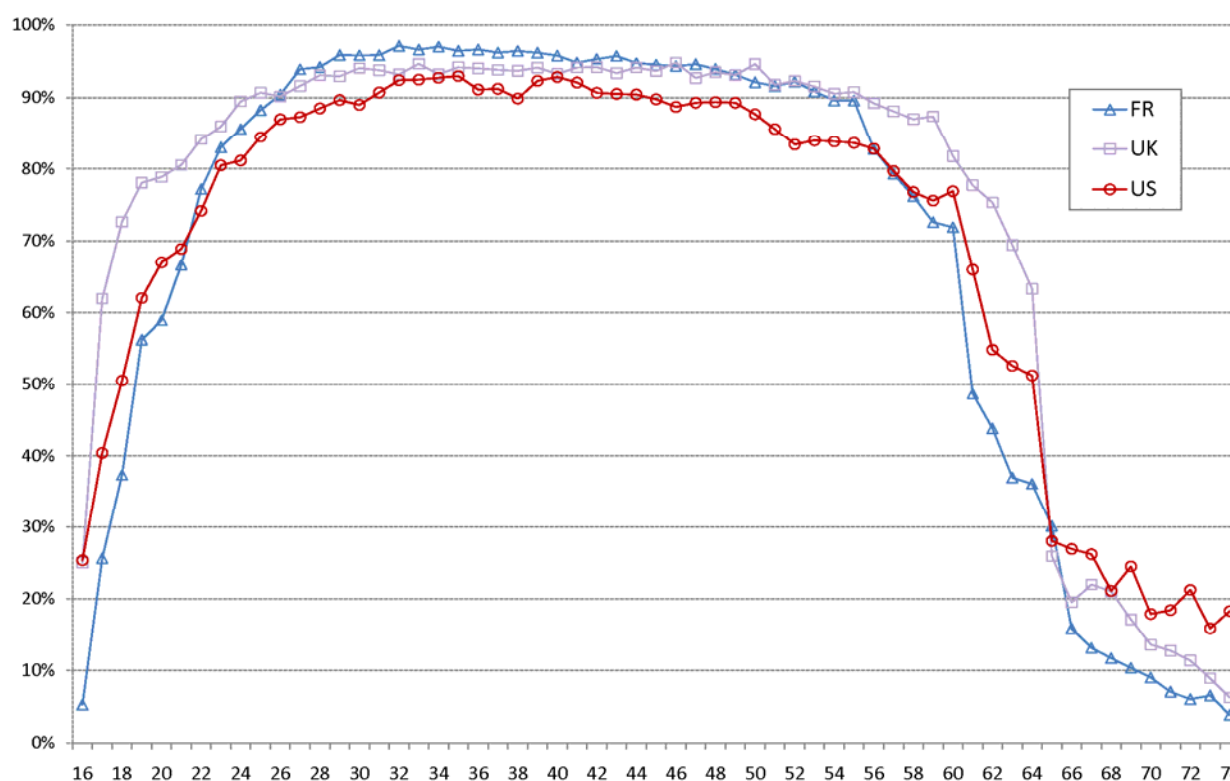
- So where are the key margins of response?
- Evidence suggests they are not all the extensive margin..
  - intensive and extensive margins both matter
  - they matter for tax policy evaluation and earnings tax design
  - and they matter in different ways by age and demographic groups
- Getting it right for men

## Employment for men by age – FR, UK and US 2007



Blundell, Bozio and Laroque (2010)

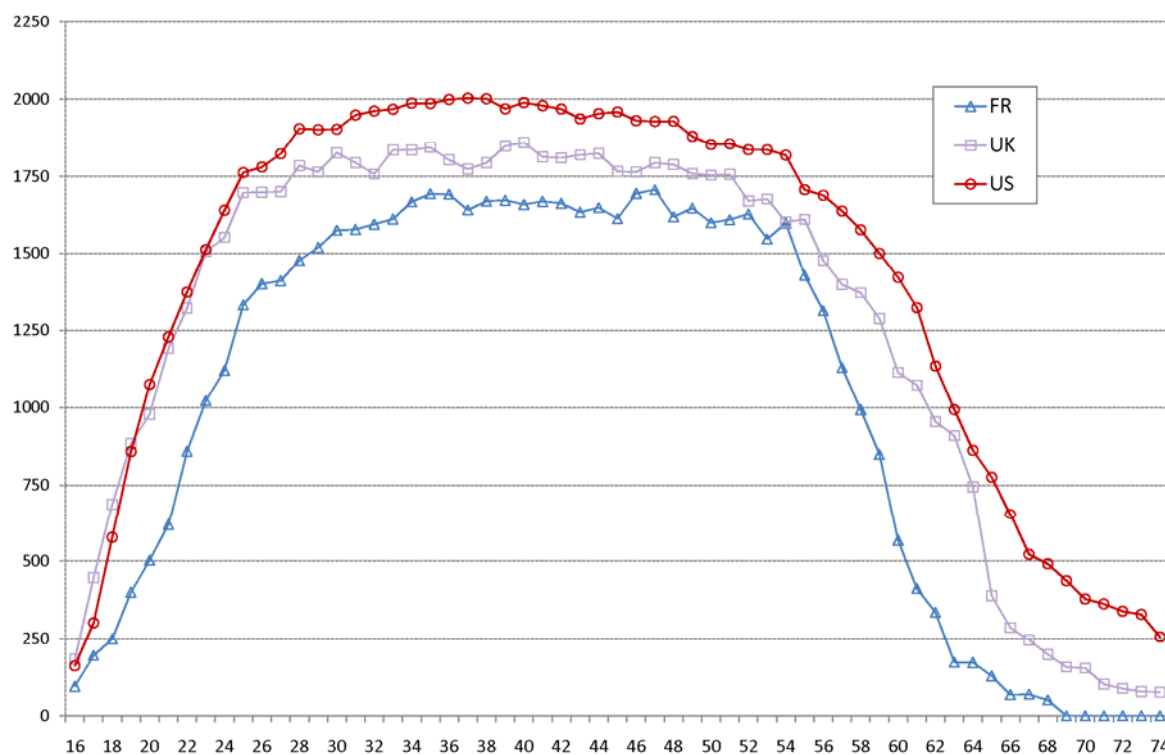
## Employment for men by age – FR, UK and US 1977



Blundell, Bozio and Laroque (2010)

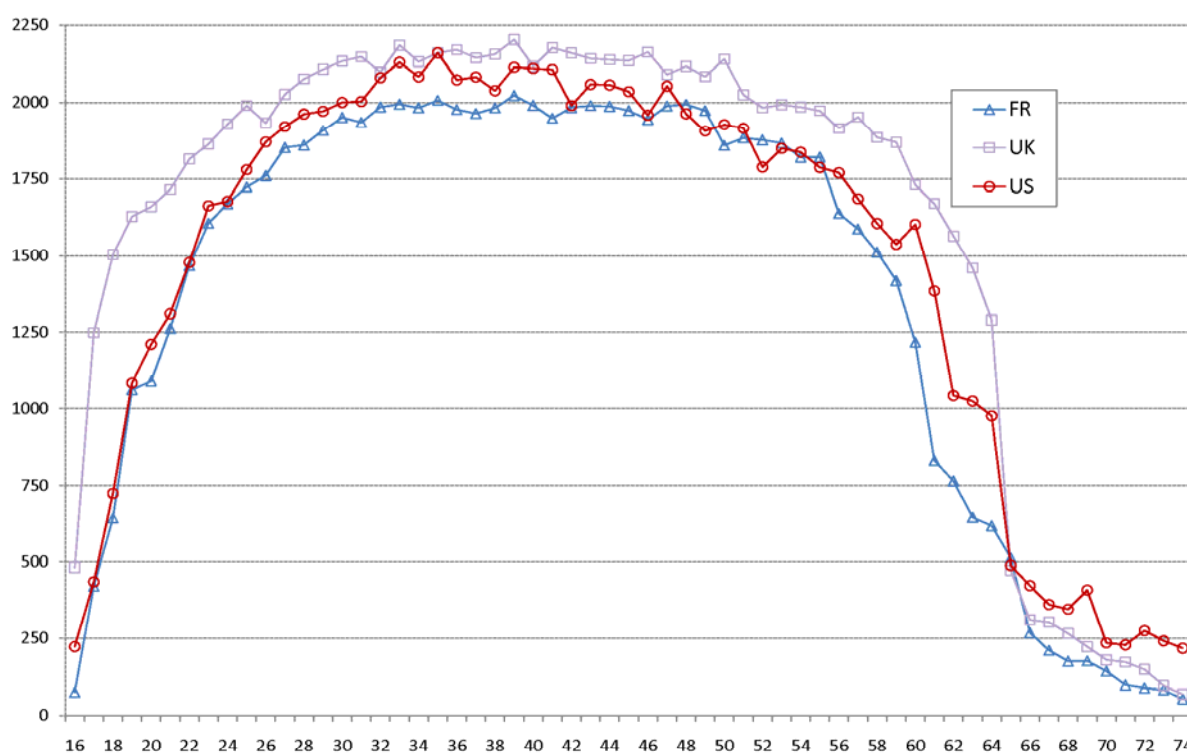


## Total Hours for men by age – FR, UK and US 2007



Blundell, Bozio and Laroque (2010)

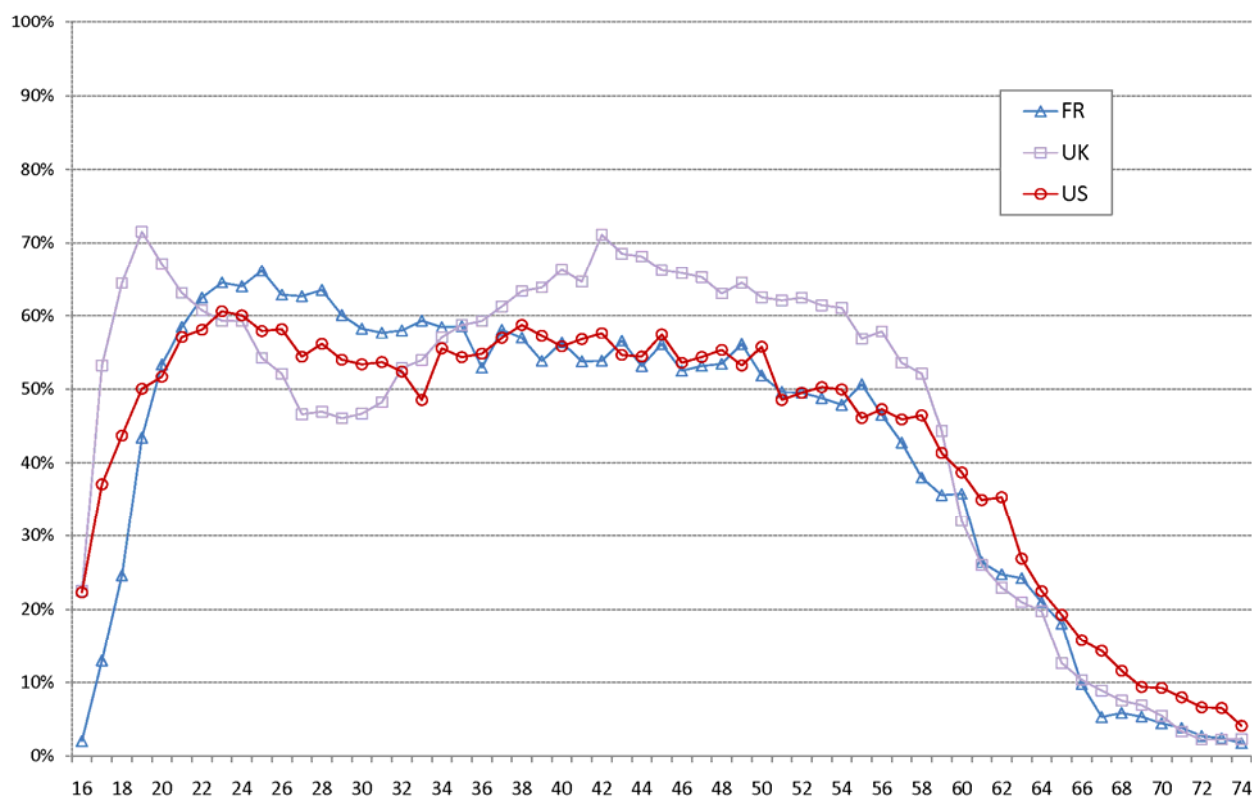
## Total Hours for men by age – FR, UK and US 1977



Blundell, Bozio and Laroque (2010)

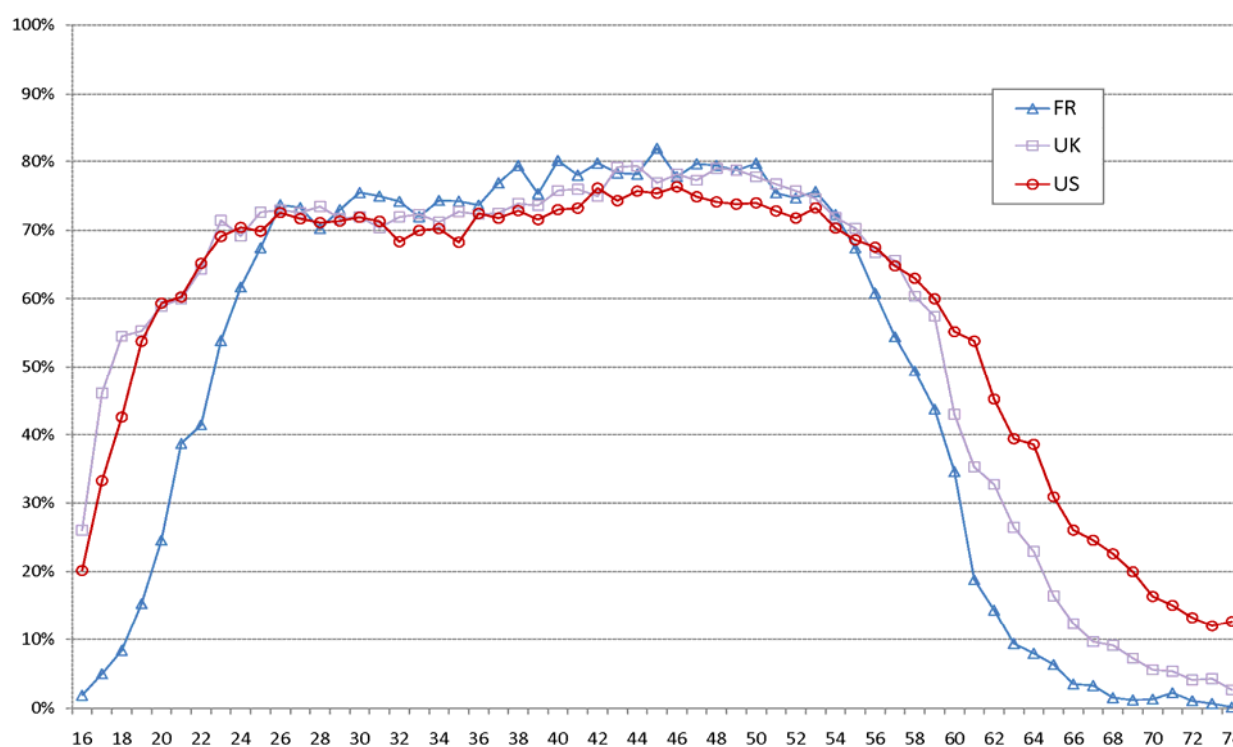
and for women .....

## Female Employment by age – US, FR and UK 1977



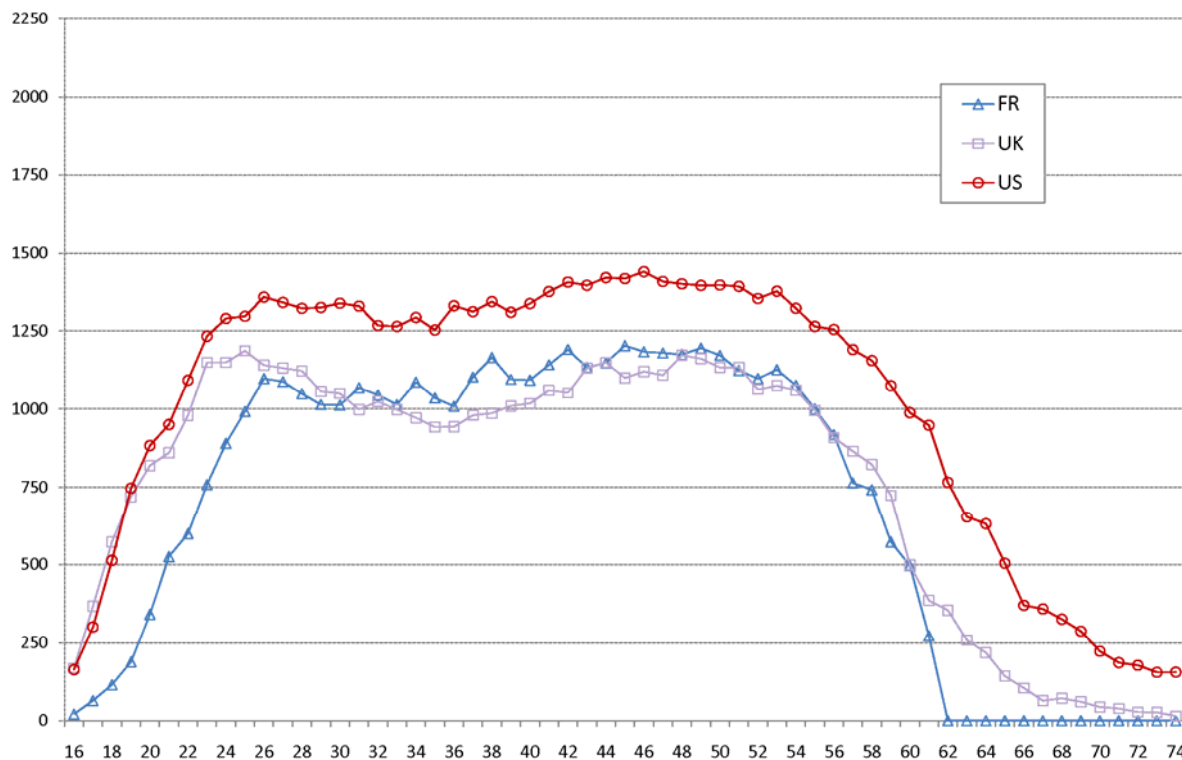
Blundell, Bozio and Laroque (2010)

## Female Employment by age – US, FR and UK 2007



Blundell, Bozio and Laroque (2010)

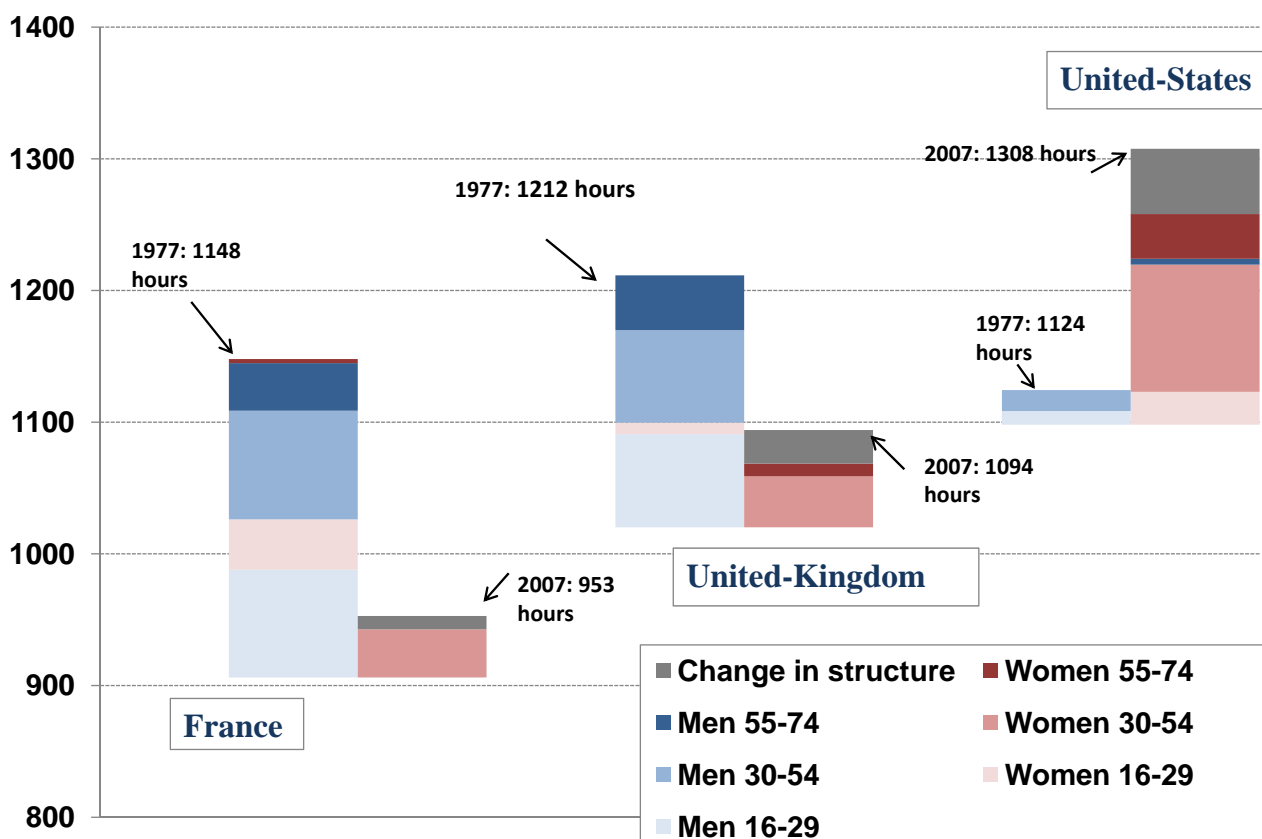
## Female Total Hours by age – US, FR and UK 2007



Blundell, Bozio and Laroque (2010)



## Decomposition of change in annual hours worked (1977-2007)



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Blundell, Bozio and Laroque (2010)

## Thinking about Responses at the Intensive and Extensive Margin

- Write within period utility as 
$$U = \begin{cases} c - \frac{h^{1+1/\alpha}}{1+1/\alpha} - \beta & \text{if } h > 0 \\ c & \text{if } h = 0 \end{cases}$$
- $\alpha$  is the intensive labour supply elasticity and she works when the value of working at wage  $w$  exceeds the fixed cost  $\beta$ .
- Convenient to describe the distribution of heterogeneity through the conditional distribution of  $\beta$  given  $\alpha$ ,  $F(\beta | \alpha)$  and the marginal distribution of  $\alpha$ .
- The labour supply and employment rate for individuals of type  $\alpha$ , is 
$$h(w, \alpha) = w^\alpha \quad \text{and} \quad p(w, \alpha) = F\left(\frac{w^{1+\alpha}}{1+\alpha}\right)$$

- The intensive and the employment rate elasticity are 
$$\varepsilon_I(\alpha) = \alpha \quad \text{and} \quad \varepsilon_E(\alpha) = w^{(1+\alpha)} f\left(\frac{w^{1+\alpha}}{1+\alpha}\right) / F\left(\frac{w^{1+\alpha}}{1+\alpha}\right)$$
- The aggregate hours elasticity is a weighted sum across the intensive and extensive margins

$$\begin{aligned} \frac{d \ln H}{d \ln w} &= \frac{1}{H} \int_{\alpha} \left[ \alpha w^\alpha F\left(\frac{w^{1+\alpha}}{1+\alpha} | \alpha\right) + w^\alpha w^{1+\alpha} f\left(\frac{w^{1+\alpha}}{1+\alpha} | \alpha\right) \right] dG(\alpha) \\ &= \frac{1}{H} \int_{\alpha} p(w, \alpha) h(w, \alpha) [\varepsilon_I(\alpha) + \varepsilon_E(\alpha)] dG(\alpha) \end{aligned}$$

- Of course, quasi-linear utility is highly restrictive and we expect income effects to matter, at least for some types of households – we use more general models with fixed costs

## Measuring Responses at the Intensive and Extensive Margin

- Suppose the population share at time  $t$  of type  $j$  is  $q_{jt}$ , then

total hours 
$$H_t = \sum_{j=1}^J q_{jt} H_{jt} \quad \text{and} \quad H_{jt} = p_{jt} h_{jt}$$

- Changes in total hours per person written as the sum of changes across all types of workers and the change in structure of the population

$$H_t - H_{t-1} = \Delta_t + S_t$$

where  $\Delta_t = \sum_{j=1}^J \Delta_{jt}$  with  $\Delta_{jt} = q_{jt-1} [H_{jt} - H_{jt-1}]$

- We can also mirror the weighted elasticity decomposition

$$\frac{\Delta H}{H} \approx \frac{1}{H} \sum_{j=1}^J q_j \left[ p_j h_j \frac{\Delta h_j}{h_j} + p_j h_j \frac{\Delta p_j}{p_j} \right]$$

- And derive **bounds** on extensive and intensive responses for finite changes

## Bounds on Intensive and Extensive Responses (1977-2007)

	Year	Men 16-29	Women 16-29	Men 30-54	Women 30-54	Men 55-74	Women 55-74
FR	I-P, I-L	[-37, -28]	[-23, -19]	[-59, -56]	[-49, -35]	[-11, -8]	[-10, -9]
	E-L, E-P	[-54, -45]	[-19, -16]	[-27, -23]	[71, 85]	[-28, -25]	[6, 7]
	$\Delta$	-82	-38	-82	36	-36	-3
UK	I-P, I-L	[-42, -36]	[-26, -23]	[-48, -45]	[-3, -2]	[-22, -19]	[-8, -6]
	E-L, E-P	[-35, -29]	[14, 17]	[-25, -22]	[41, 41]	[-23, -20]	[15, 17]
	$\Delta$	-71	-9	-70	39	-42	10
US	I-P, I-L	[-6, -6]	[1, 1]	[-5, -5]	[14, 19]	[3, 3]	[3, 5]
	E-L, E-P	[-13, -13]	[21, 21]	[-14, -14]	[72, 77]	[3, 3]	[33, 35]
	$\Delta$	-19	22	-19	90	6	38

## Why is this distinction important for tax design?

- Some key lessons from recent tax design theory (Saez (2002, Laroque (2005), ..)
- A 'large' extensive elasticity at low earnings can 'turn around' the impact of declining social weights
  - implying a higher optimal transfer to low earning workers than to 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? – marginal rates become endogenous...
- Importance of margins other than labour supply/hours
  - use of taxable income elasticities to guide choice of top tax rates
- Importance of dynamics and frictions

## Focus first on tax rates on lower incomes

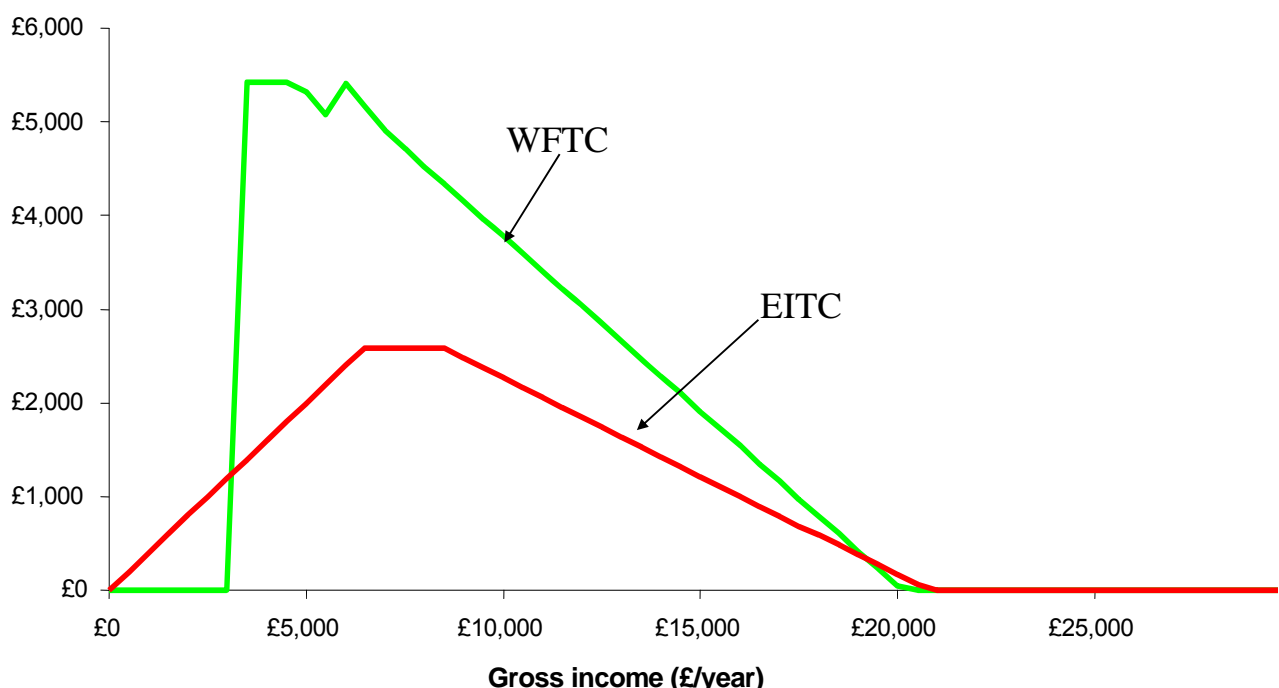
### Main (apparent) defects in current welfare/benefit systems

- 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 in the UK...

## Particular Features of the UK Working Tax Credit

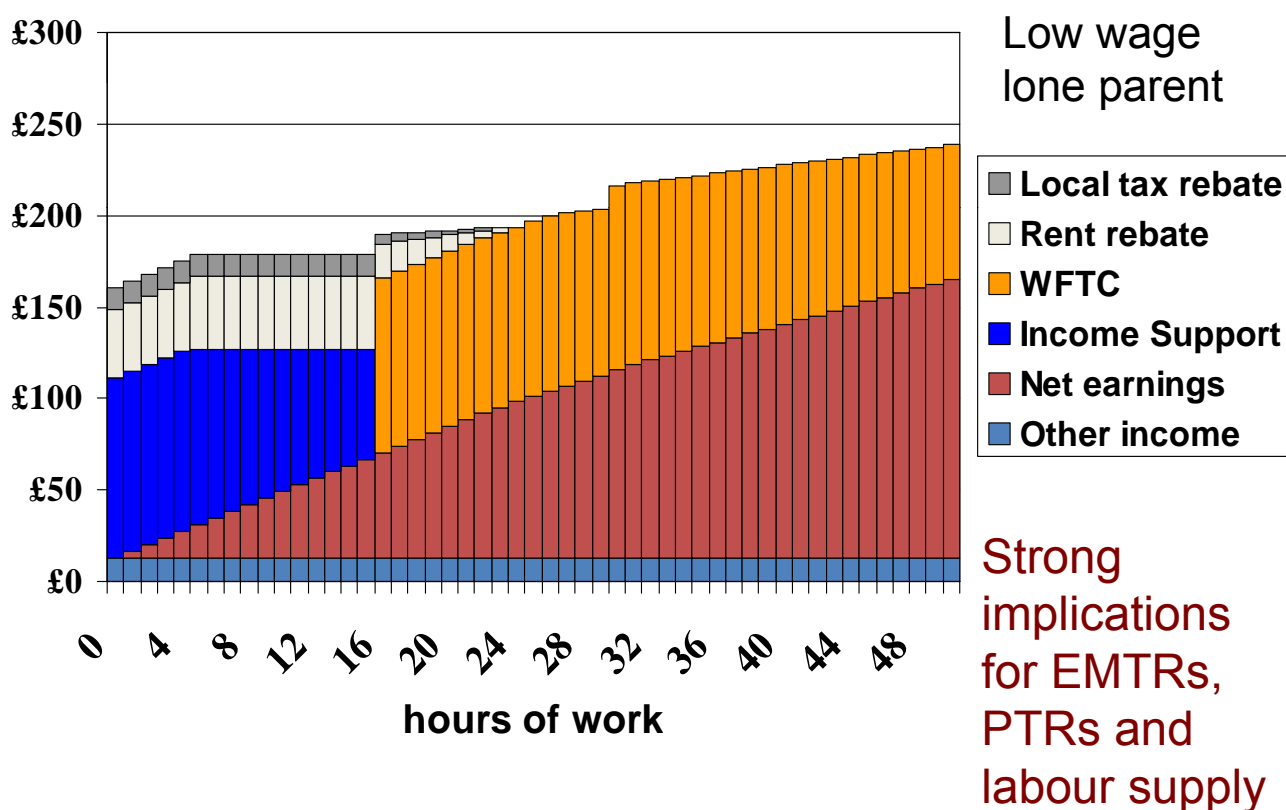
- hours of work condition
  - minimum hours rule - 16 hours per week
  - an additional hours-contingent payment at 30 hours
- family eligibility
  - children (in full time education or younger)
  - adult credit plus amounts for each child
- income eligibility
  - family net income below a certain threshold
  - credit is tapered away at 55% (previously 70% under FC)

## The US EITC and the UK WFTC compared

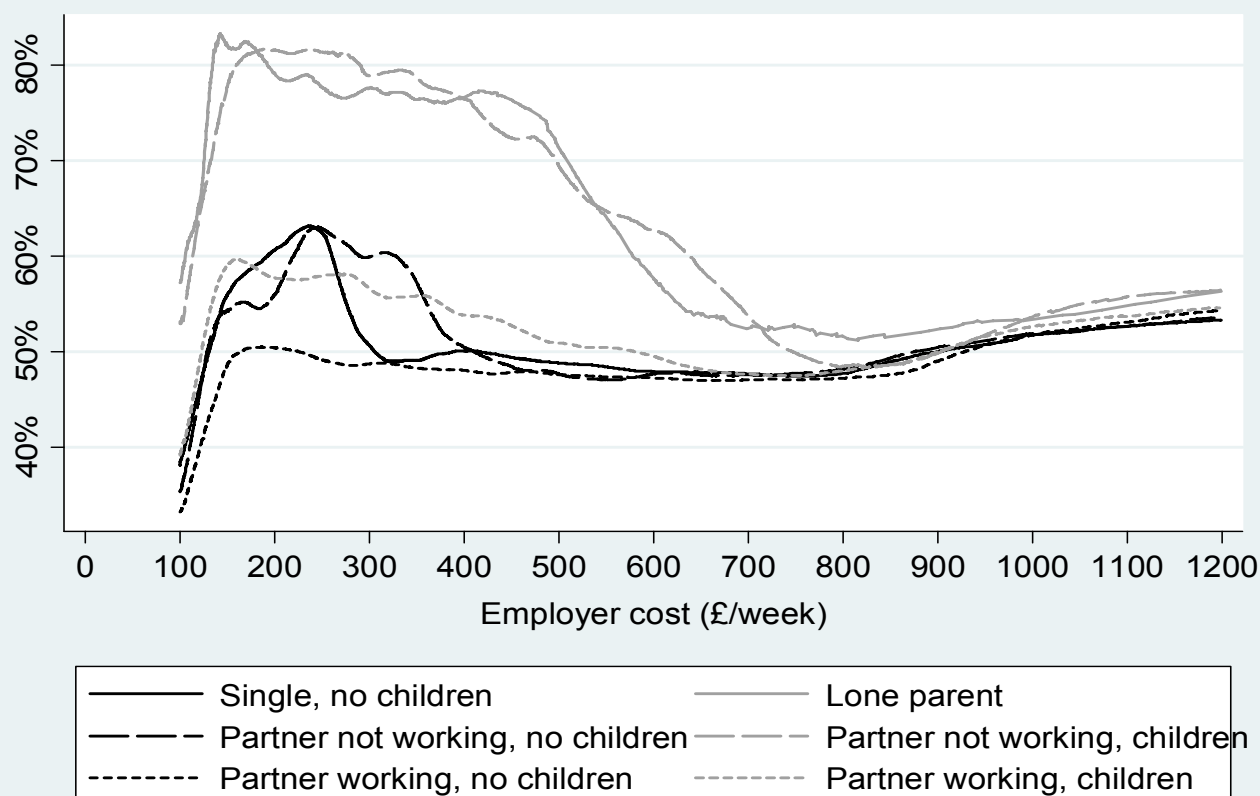


- **Puzzle: WFTC about twice as generous as the US EITC but with about half the impact. Why?**

## The interaction of WFTC with other benefits in the UK

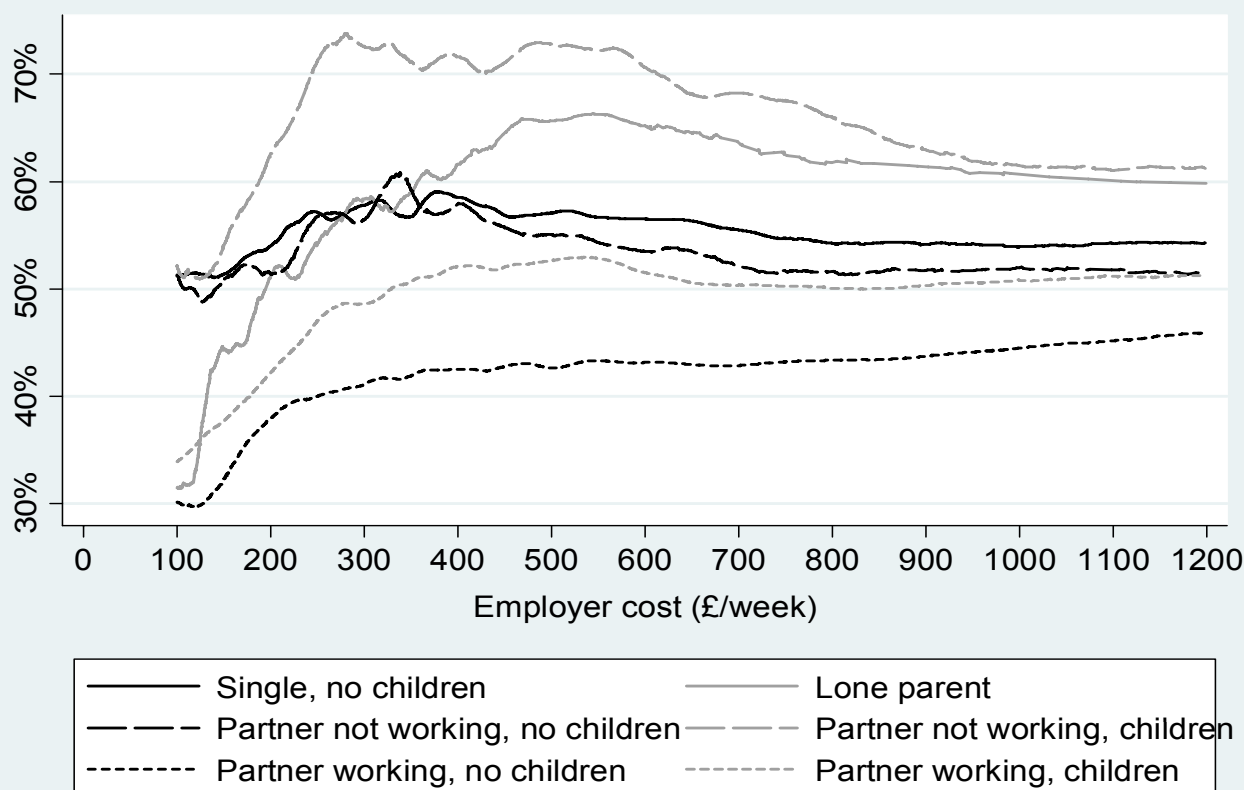


## Average EMTRs for different family types



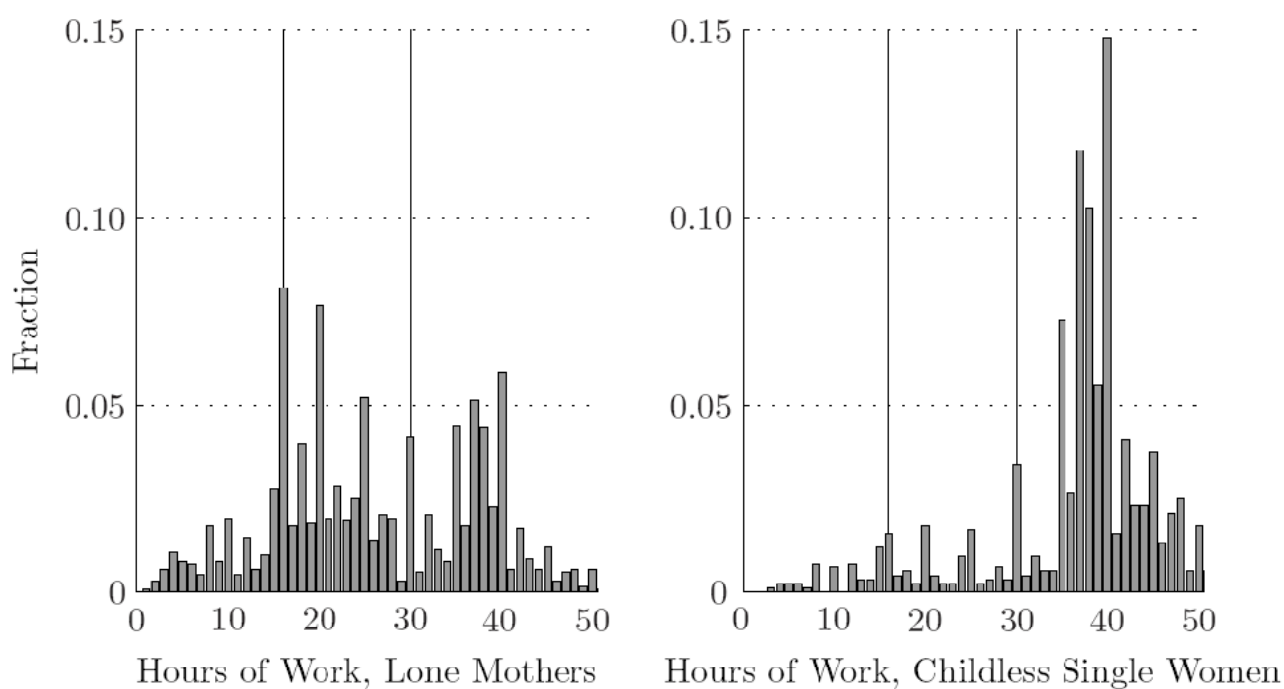


## Average PTRs for different family types



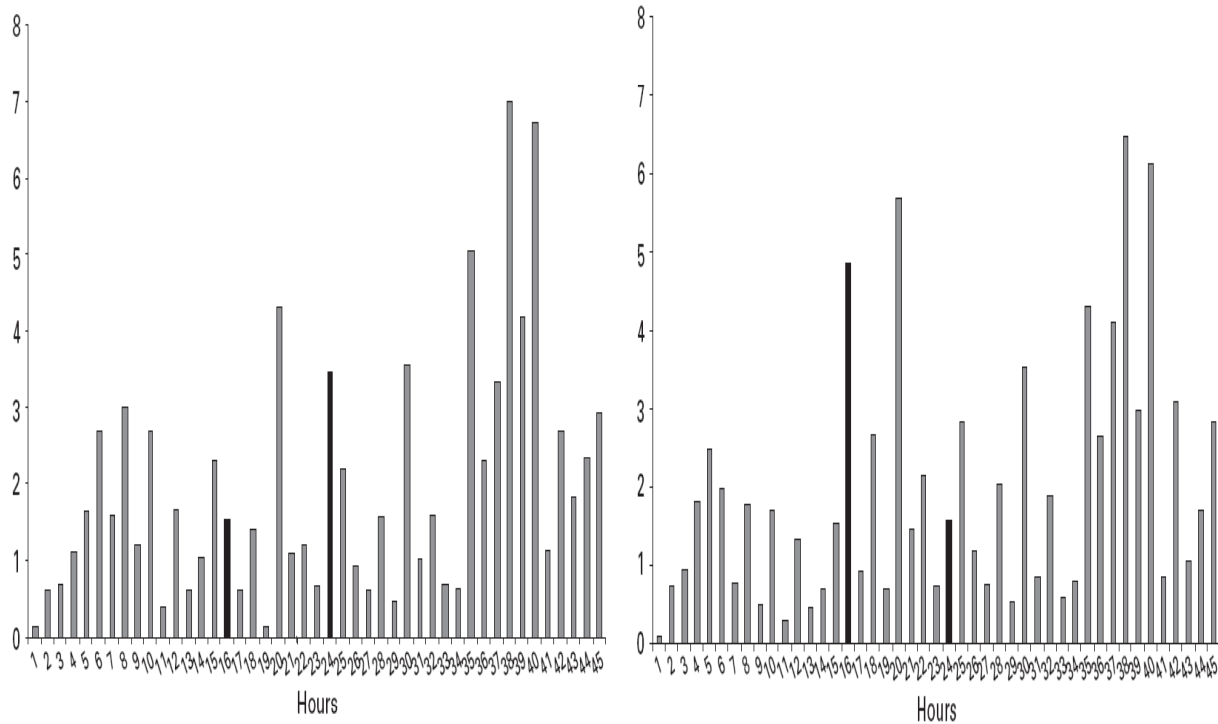
## Can the reforms explain weekly hours worked?

Single Women (aged 18-45) - 2002



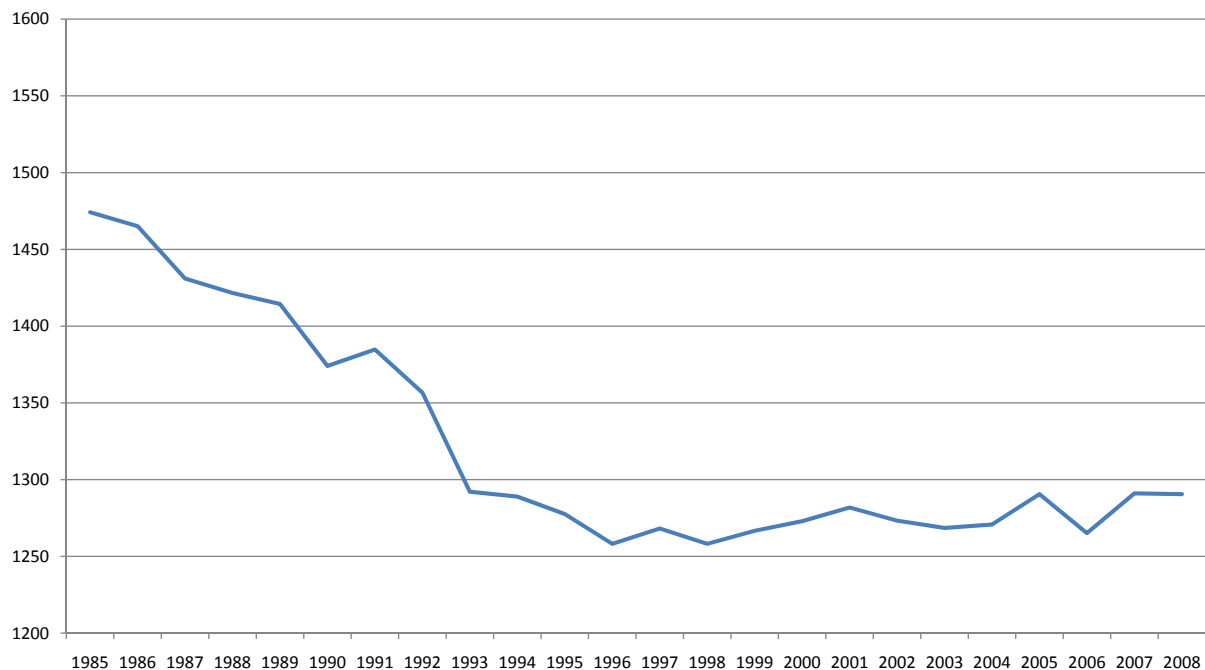
Blundell and Shephard (2009)

## Hours' distribution for lone parents, before and after the 16 hour reform in 1992

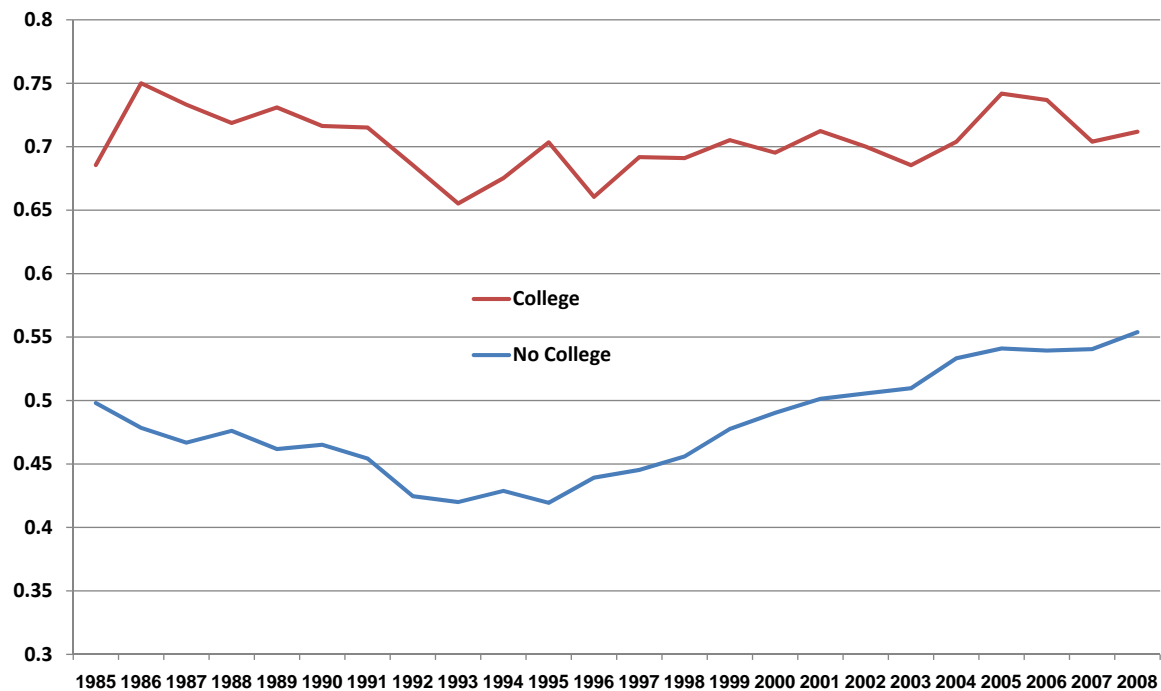


Blundell and Shephard (2010)

## Hours trend for low ed lone parents in UK



## Employment trends for lone parents in UK



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

### Average Impact on % Employment Rate of Single Mothers

<i>Single Mothers</i>	Marginal Effect	Standard Error	Sample Size
Family Resources Survey	4.5	1.55	25,163
Labour Force Survey	4.7	0.55	233,208

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

Base employment level: 45% in Spring 1998.

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

## An Empirical Analysis in Two Steps

- The first step (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 second step (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’

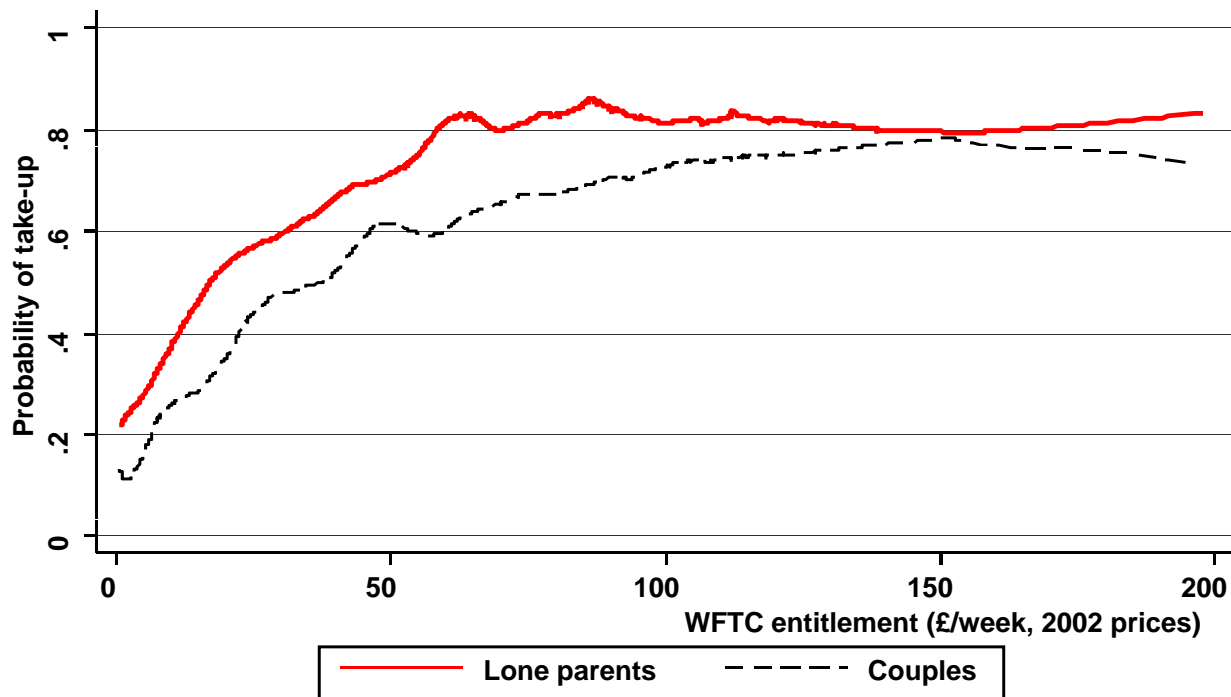
## Key features of the structural model

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

- Structural model allows for
  - unobserved work-related fixed costs
  - childcare costs
  - observed and unobserved heterogeneity
  - programme participation ‘take-up’ costs
- See Blundell and Shephard (2010)

# Importance of take-up and information/hassle costs

## Variation in take-up probability with entitlement to WFTC



## Preference Specifications

Preferences:

$$U_p(c, h, P; X, \varepsilon) = \alpha_y(X, \varepsilon) \frac{c^{\theta_y(X)} - 1}{\theta_y(X)} + \alpha_l(X, \varepsilon) \frac{(1 - h/H)^{\theta_l(X)} - 1}{\theta_l(X)} - P \cdot \eta(X, \varepsilon)$$

where

$$\alpha_j = \exp[X_j \beta_j + \varepsilon_j]$$

where the 'cost' of receiving in-work support is given by

$$\eta(X, \varepsilon) = X_\eta \beta_\eta + \varepsilon_\eta$$

Also allow higher order polynomial and interaction terms.

## Childcare costs

Assume stochastic relationship between total hours of childcare and maternal hours of work

$$\alpha_c(h, X, \varepsilon) = 1[h > 0] \cdot 1[\varepsilon_c < -\beta_c h] \cdot (\beta_c h + \varepsilon_c)$$

## Fixed costs of work

$$f = \alpha_f(X, \varepsilon) 1[h > 0]$$

## Consumption at given hours and programme participation

$$c(h, P; T, X, \varepsilon) = wh - T(wh, h, P; X) \\ - p_c(X, \varepsilon)h_c - f$$

## Programme participation (Take-up) model

We denote  $P^*(h) \in \{0, E(h; X, \varepsilon)\}$

as the optimal choice of programme participation for given hours  $h$ , where  $E(h; X, \varepsilon) = 1$  if the individual is eligible at hours  $h$ .

Assuming eligibility,  $P^*(h) = 1$  if and only if

$$U(c(h, P=1; T, X, \varepsilon), h, P=1; X, \varepsilon) \\ \geq U(c(h, P=0; T, X, \varepsilon), h, P=0; X, \varepsilon)$$

The optimal choice of hours  $h^* \in H$  maximises

$$U(c(h, P^*(h); T, X, \varepsilon), h, P^*(h); X, \varepsilon, \varepsilon_h)$$

## Estimation

- 1995-1999: pre-reform estimation data (ex-ante)
- 2001-2003: 'post-reform' validation sample
- Use complete sample for ex-ante analysis of 2004 and more recent reform proposals
- Sample restricted to lone mothers aged 18-45
- Jointly estimate wages, take-up, childcare and preferences by simulated maximum likelihood:
  - Incorporate detailed/accurate model of tax and transfer system

## Structural Model Elasticities – low education lone parents

### (a) Youngest Child Aged 5-10

<i>Weekly Earnings</i>	<i>Density</i>	<i>Extensive</i>	<i>Intensive</i>
0	0.4327		
50	0.1575	0.280 (.020)	0.085 (.009)
150	0.1655	0.321 (.009)	0.219 (.025)
250	0.1298	0.152 (.005)	0.194 (.020)
350	0.028	0.058 (.003)	0.132 (.010)
<i>Employment elasticity</i>		0.820 (.042)	

## Structural Model Elasticities – low education lone parents

### (b) Youngest Child Aged 11-18

<i>Weekly Earnings</i>	<i>Density</i>	<i>Extensive</i>	<i>Intensive</i>
0	0.3966		
50	0.1240	0.164 (.018)	0.130 (.016)
150	0.1453	0.193 (.008)	0.387 (.042)
250	0.1723	0.107 (.004)	0.340 (.035)
350	0.1618	0.045 (.002)	0.170 (.015)
<i>Employment elasticity</i>		0.720 (.036)	

Blundell and Shephard (2010)



## Structural Model Elasticities – low education lone parents

### (c) Youngest Child Aged 0-4

<i>Weekly Earnings</i>	<i>Density</i>	<i>Extensive</i>	<i>Intensive</i>
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)
<i>Participation elasticity</i>		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:

### Impact of all Reforms (WFTC and IS)

	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:	4.89	0.65	5.53	6.83	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.

## 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
- Compare *simulated diff-in-diff moment* with *diff-in-diff*
  - .21 (.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)

## How do we think about an optimal design?

- Assume we want to redistribute ‘£R’ to low ed. single parents, what is the ‘optimal’ way to do this?
- Recover optimal tax/credit schedule in terms of earnings
  - use Diamond-Saez approximation in terms of extensive and intensive elasticities at different earnings:

$$\frac{T_i - T_{i-1}}{c_i - c_{i-1}} = \frac{1}{e_i h_i} \sum_{j \geq i}^I h_j \left[ 1 - g_j - \eta_j \frac{T_j - T_0}{c_j - c_0} \right].$$

- Alternatively a ‘complete’ Mirrlees optimal tax computation

## 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  $X, \varepsilon$

$$W = \int \int_{X \varepsilon} \Upsilon(U(c(h^*; T(w, h^*; X), h^*; X, \varepsilon))) dF(\varepsilon) dG(X)$$

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

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

for a given  $R$ .

- We solve for  $T(\cdot)$  with structural estimation and simulation.

Control preference for equality by transformation function:

$$\Upsilon(U | \theta) = \frac{1}{\theta} \{ (\exp U)^\theta - 1 \}$$

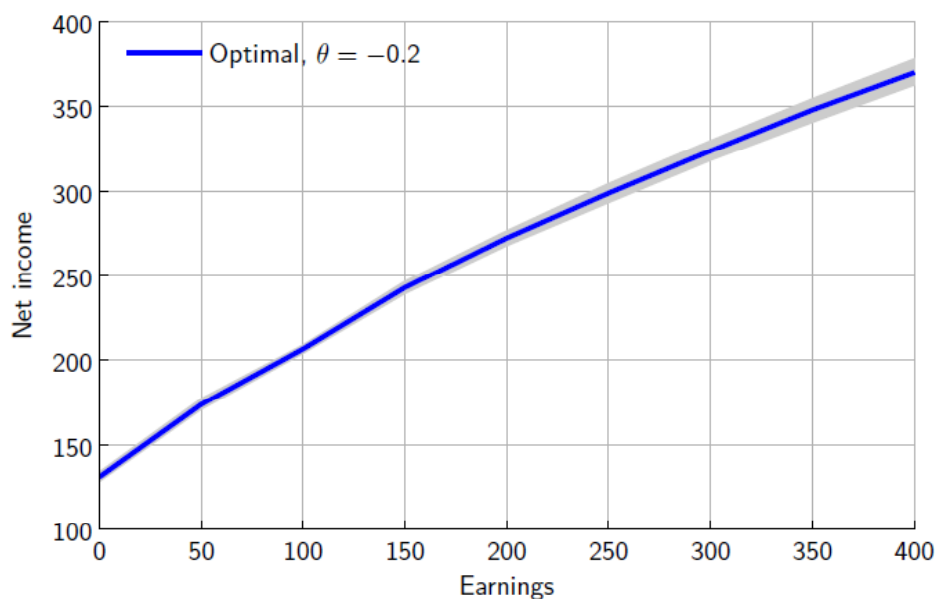
when  $\theta$  is negative, the function favors the equality of utilities.  $\theta$  is the coefficient of (absolute) inequality aversion.

**Proposition:** If  $\theta < 0$  then analytical solution to integral over (Type I extreme-value)  $j$  state specific errors

$$\frac{1}{\theta} \left[ \Gamma(1 - \theta) \cdot \left( \sum_{h \in H} \exp u(c(h; T, X, \varepsilon))^\theta - 1 \right) \right]$$

Objective: robust policies for fairly general social welfare weights, document the weights in each case (Table 7 BS, 2010)

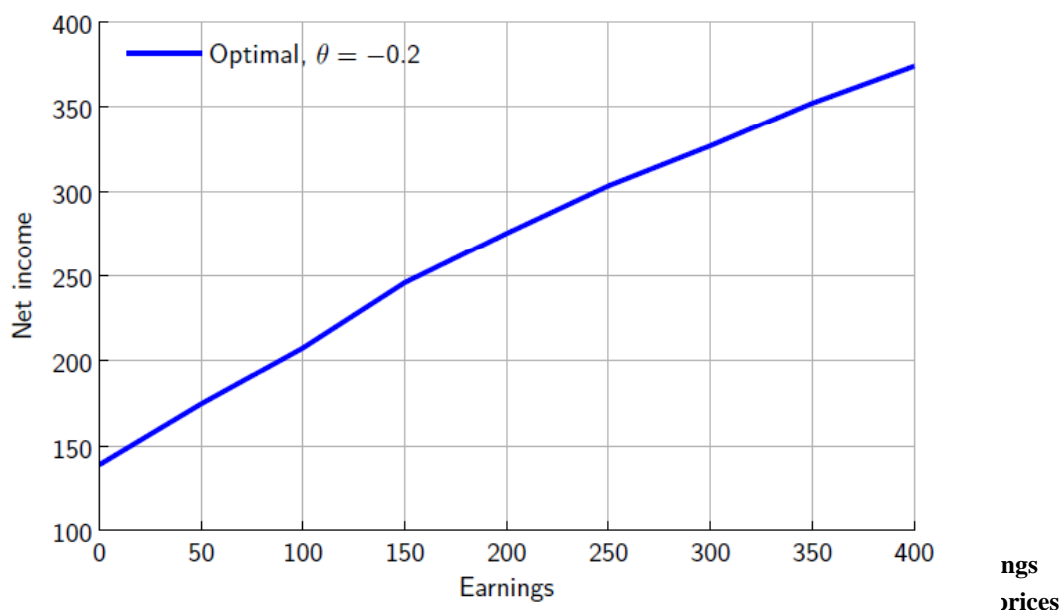
## Implied Optimal Schedule



March 2002 prices

## Implied Optimal Schedule

Optimal earnings schedules, youngest child 0–4

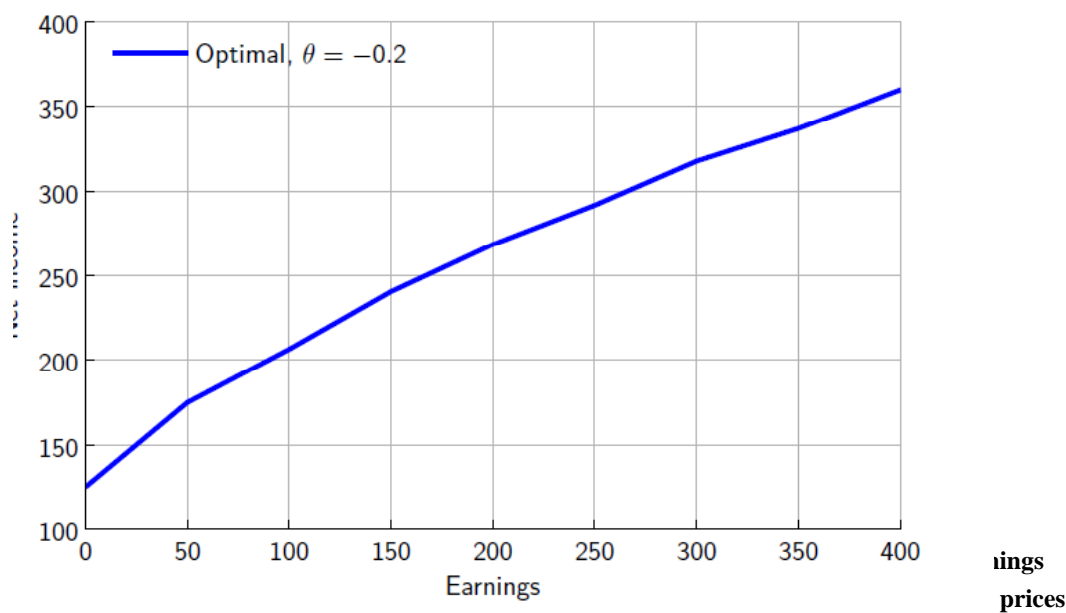


Blundell and Shephard (2010)



## Implied Optimal Schedule

Optimal earnings schedules, youngest child 5–10



Blundell and Shephard (2010)

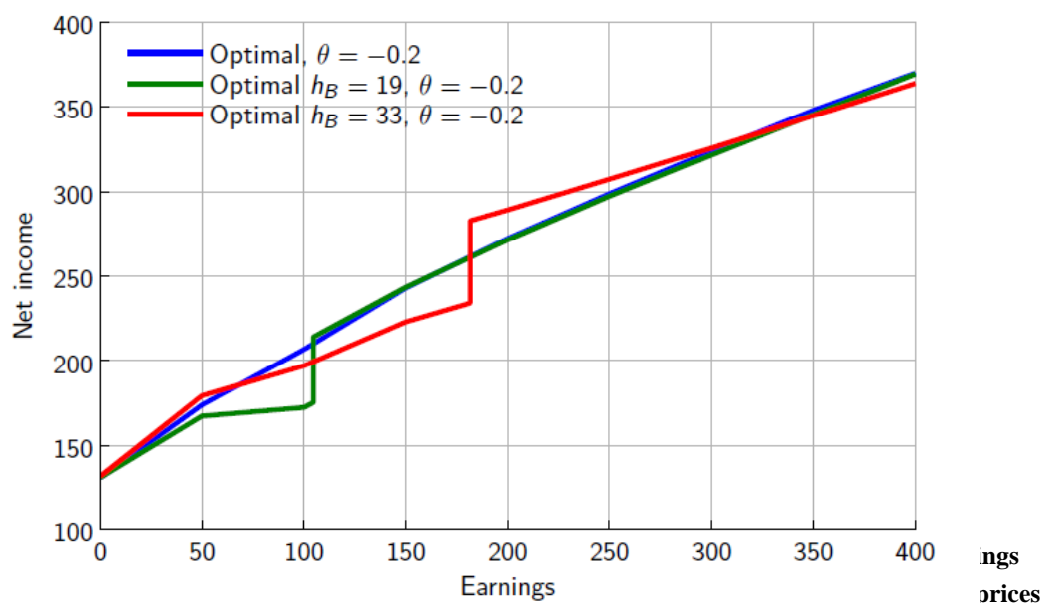


## Key findings (under range of $\theta$ considered here):

- Marginal rates are broadly increasing in earnings for all groups
- A shift of out of work support towards families with younger children.
  - an optimal tax schedule with ‘tagging’ according to age of children.
- Moreover, we find pure tax credits at low earnings for those with school aged children
- Compared to current system, it implies higher employment
  - (see also Tax by Design)

## Implied Optimal Schedule

### Optimal schedule with hours bonuses



## Quantifying Welfare Gains from Hours Rules

We ask: what increase in expenditure  $dR/R$  is required to achieved the same level of social welfare if only earnings is revealed?

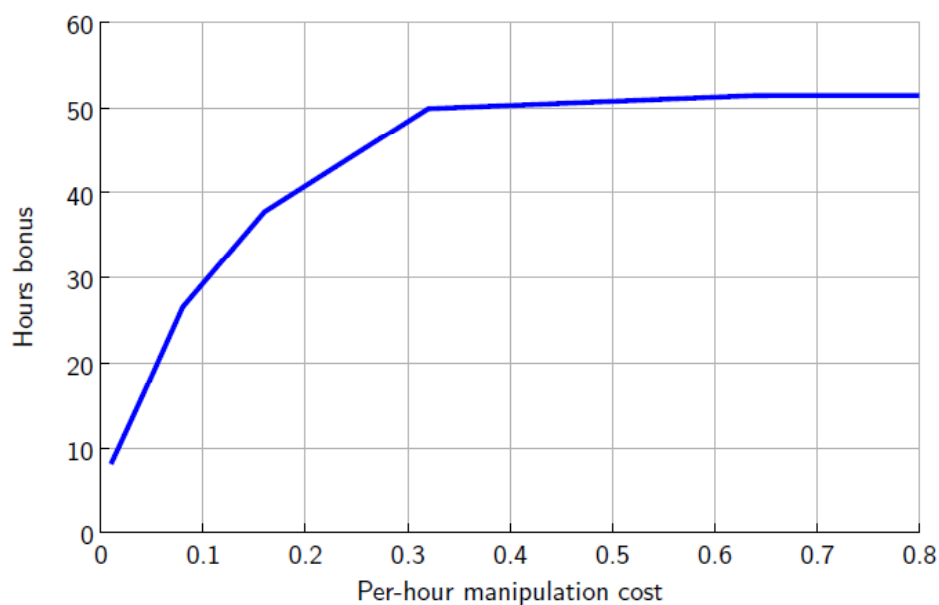
19 hours			optimal hours		
$\theta = -0.4$	$\theta = -0.2$	$\theta = 0.0$	$\theta = -0.4$	$\theta = -0.2$	$\theta = 0.0$
0.9%	0.8%	0.2%	2.2%	2.5%	1.8%

Blundell and Shephard (2010)



## Sensitivity of Optimal Hours Bonus

Bonus with hours manipulation,  $\theta = -0.2$



Blundell and Shephard (2010)

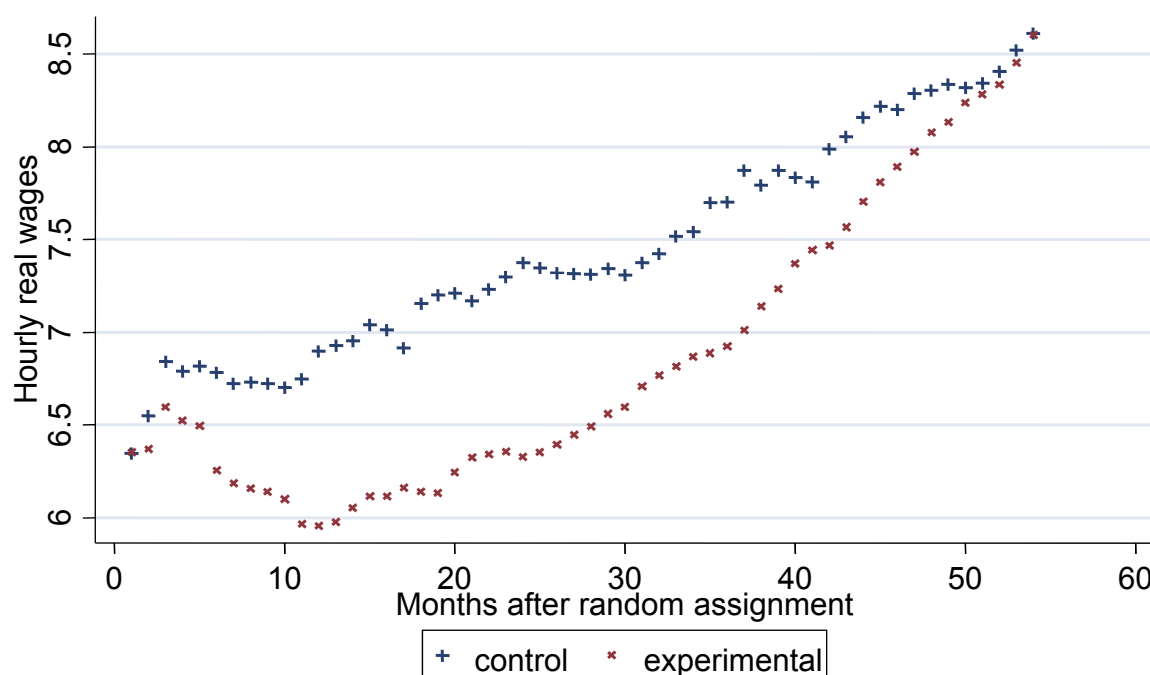


## Implications for Tax Reform

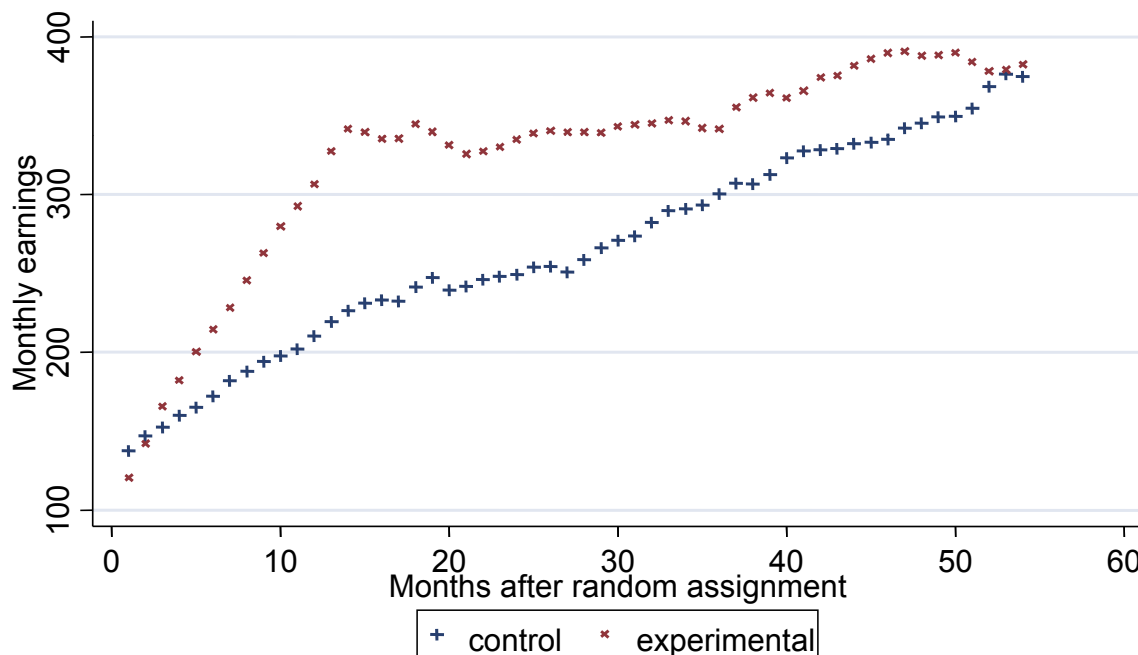
- Change transfer/tax rate structure to match lessons from new optimal tax analysis and empirical evidence
- *Life-cycle view of taxation*
  - tagging by age of (youngest) child for mothers/parents
  - also pre-retirement ages - see chapter 4.
- *A life-cycle rearrangement of tax incentives and welfare payments to match elasticities and early years investments*
  - simulation results in Tax by Design show significant employment and earnings increases
- *Hours rules? at full time for older kids,*
  - welfare gains depend on ability to monitor hours
- *Dynamics and frictions?*

## Dynamic effects on wages for low income welfare recipients?

SSP: Hourly wages by months after RA



## SSP: Monthly earnings by months after RA



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## Evidence on experience effects from the SSP

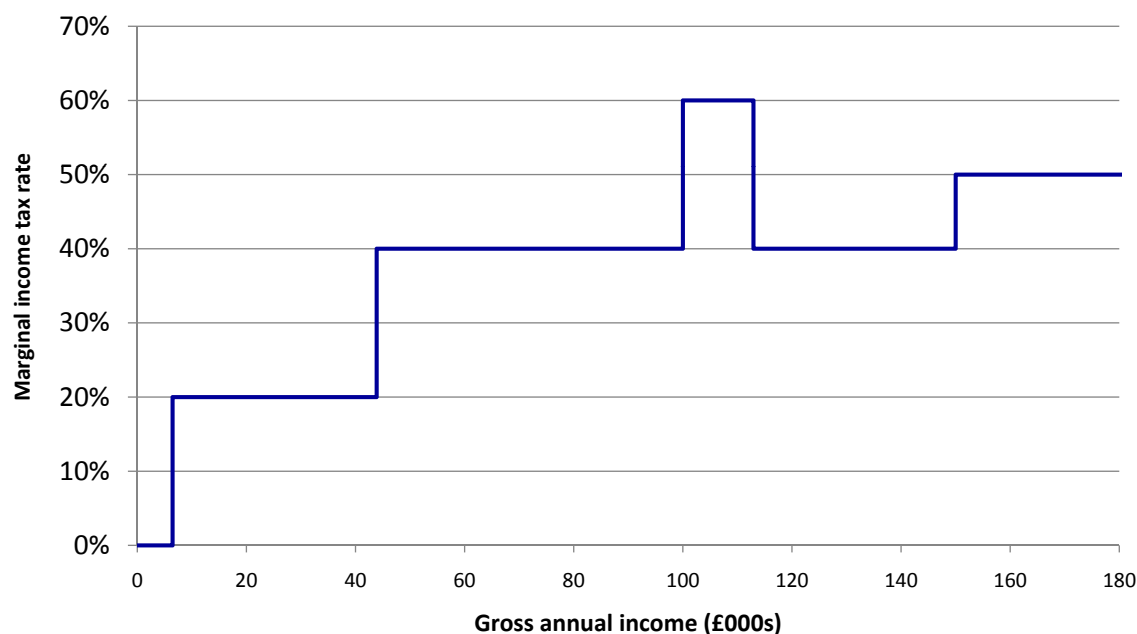
- Little evidence of employment enhancement or wage progression
- Other evidence, Taber etc, show some progression but quite small
- Remains a key area of research
  - ERA policy experiment in UK has similar findings to the SSP

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## At the top too... the income tax system lacks coherence

### UK Income tax schedule for those aged under 65, 2010–11



## Top tax rates and taxable income elasticities

An 'optimal' top tax rate (Brewer, Saez and Shephard, MRI)

$e$  – taxable income elasticity

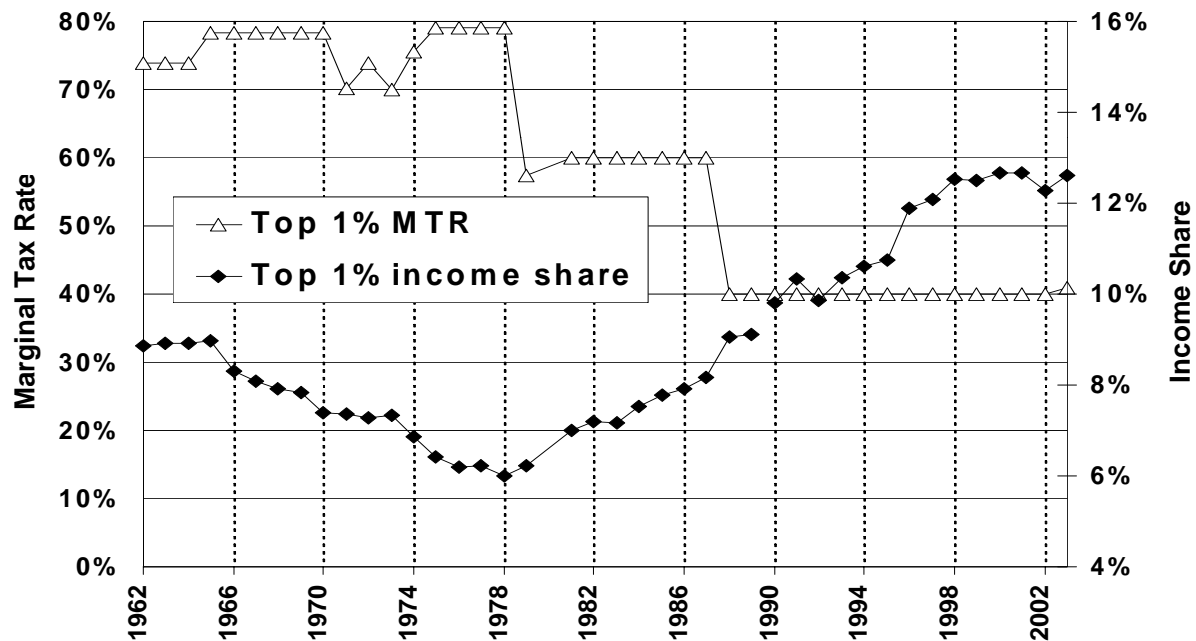
$t = 1 / (1 + a \cdot e)$  where  $a$  is the Pareto parameter.

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

Estimate  $a$  ( $\approx 1.8$ ) from the empirical distribution

# Top incomes and taxable income elasticities

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



Source: MR1, UK SPI (tax return data)



## Taxable Income Elasticities at the Top

Simple Difference (top 1%)      DD using top 5-1%  
as control

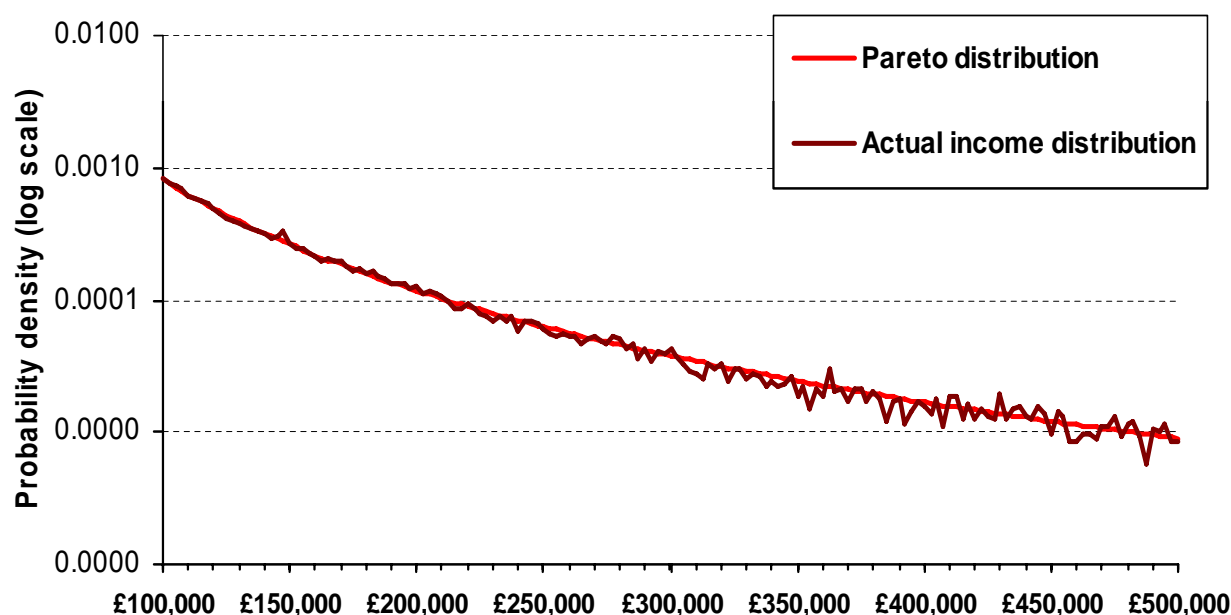
1978 vs 1981	0.32	0.08
1986 vs 1989	0.38	0.41
1978 vs 1962	0.63	0.86
2003 vs 1978	0.89	0.64
Full time series	0.69 (0.12)	0.46 (0.13)

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)



## 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%.

## Reforming Taxation of Earnings

- Change transfer/tax rate structure to match lessons from 'new' optimal tax analysis
- lower marginal rates at the bottom
  - means-testing should be less aggressive
  - tagging by age of youngest child
- age-based taxation
  - pre-retirement ages
- limits to tax rises at the top, but
  - base reforms - anti-avoidance, domicile rules, revenue shifting
- Integrate different benefits and tax credits
  - improve administration, transparency, take-up, facilitate coherent design
- Undo distributional effects of the rest of the package.

### III: Consumption and Savings Taxation: Key Margins of Adjustment

- Consumer demand responses
  - responses to differential taxation of across commodities
- Savings-pension portfolio mix
  - ‘Life-cycle’ accumulation of savings and pension contributions
- Forms of remuneration
  - CGT reforms and the non-alignment with labour income rates
- Organisational form
  - UK chart on incorporations and tax reforms
- Draw on evidence from *Dimensions of Tax Design*

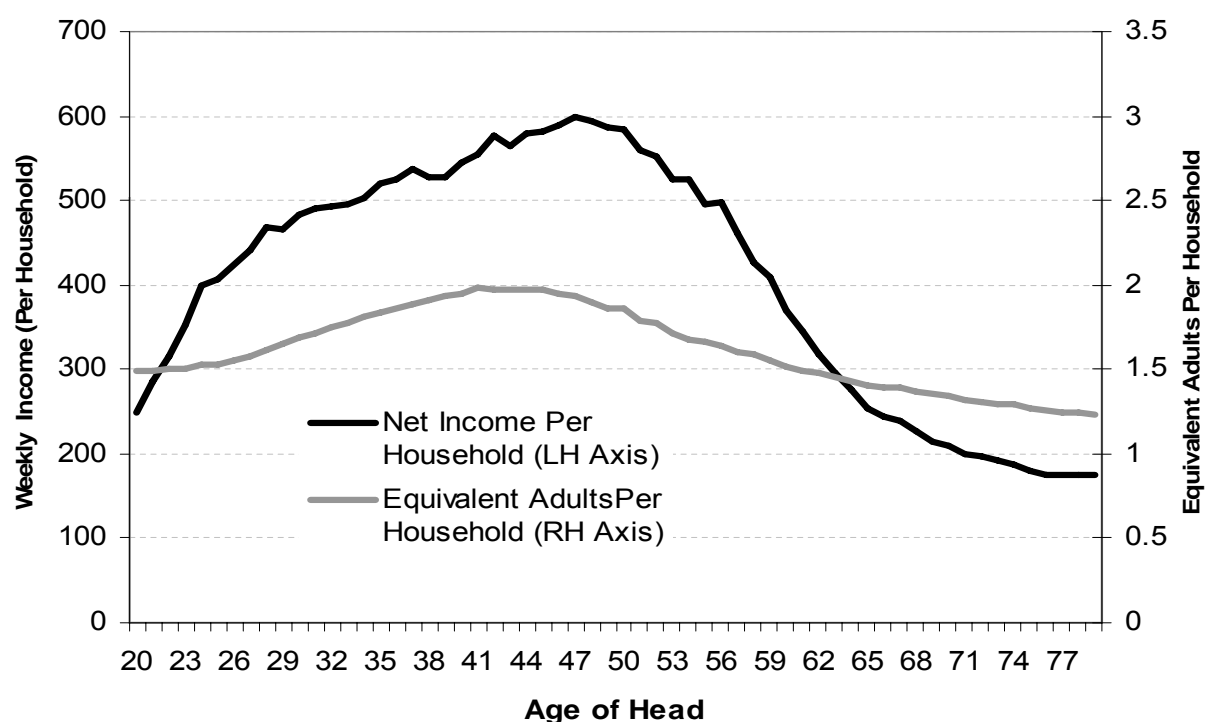
### Consumer demand behaviour

- Three key empirical observations:
- Non-separabilities with labour supply are important
  - but mainly for childcare and work related expenditures
  - updated evidence in the Review
- Price elasticities differ with total expenditure/wealth
  - responses and welfare impact differs across the distribution
  - new evidence shows compensation and welfare losses vary across the distribution
- Issues around salience of indirect taxes
  - Chetty et al (*AER*)

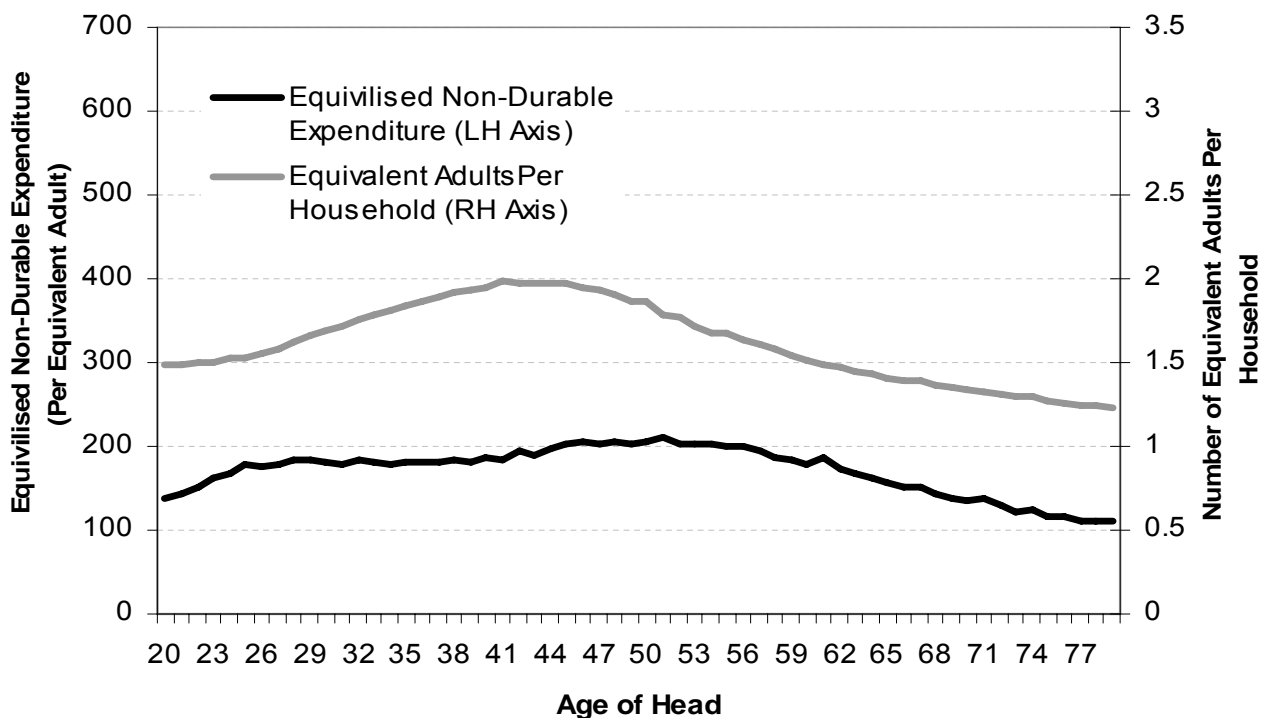
## Savings and Pensions

- How much life-cycle consumption/needs smoothing goes on?
- - permanent/ transitory shocks to income across wealth distribution (Blundell, Pistaferri and Preston (*AER*))
- - consumption and savings at/after retirement (BBT (*AER*))
- - how well do individuals account for future changes?
  - UK pension reform announcements Attanasio & Rohwedder (*AER*)
  - Liebman, Luttmer & Seif (*AER*)
- Intergeneration transfers - Altonji, Hayashi & Kotlikoff, etc
  - more recent evidence on bequests

## Net Income, Number of Equivalent Adults per Household



## Consumption and Needs



Source: UK FES 1974-2006

## Savings and Pensions Taxation

- Temporal preferences, ability, cognition, framing..
  - Banks & Diamond (MRI chapter); Diamond & Spinnewijn, Saez, ..
- Earnings/skill uncertainty – across life-cycle and business cycle
  - Role in dynamic fiscal policy arguments for capital taxation Kocherlakota; Golosov, Tsyvinski & Werning, ..

# Implications for Reform

- Indirect Taxation
- Taxation of Savings
- An integrated and revenue neutral analysis of reform...

- Evidence on consumer behaviour => exceptions to uniformity
  - Childcare strongly complementary to paid work
  - Various work related expenditures (QUAIDS on FES, MRI)
  - Human capital expenditures
  - ‘Vices’: alcohol, tobacco, betting, possibly unhealthy food have externality / merit good properties → keep ‘sin taxes’
  - Environmental externalities (three separate chapters in MRII)
- These do not line up well with existing structure of taxes
  - ⇒ Broadening the base – many zero rates in UK VAT
- Compensating losers, even on average, is difficult
  - Worry about work incentives too
  - Work with set of direct tax and benefit instruments as in earnings tax reforms

## Indirect Taxation – UK case

<b>Zero-rated:</b>	<b>Estimated cost (£m)</b>
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
Cycle helmets	10
<b>Reduced-rated:</b>	
Domestic fuel and power	2,950
Contraceptives	10
Children's car seats	5
Smoking cessation products	10
Residential conversions and renovations	150
<b>VAT-exempt:</b>	
Rent on domestic dwellings	3,500
Rent on commercial properties	200
Private education	300
Health services	900
Postal services	200
Burial and cremation	100
Finance and insurance	4,500

Impact on budget share of labour supply  
- 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



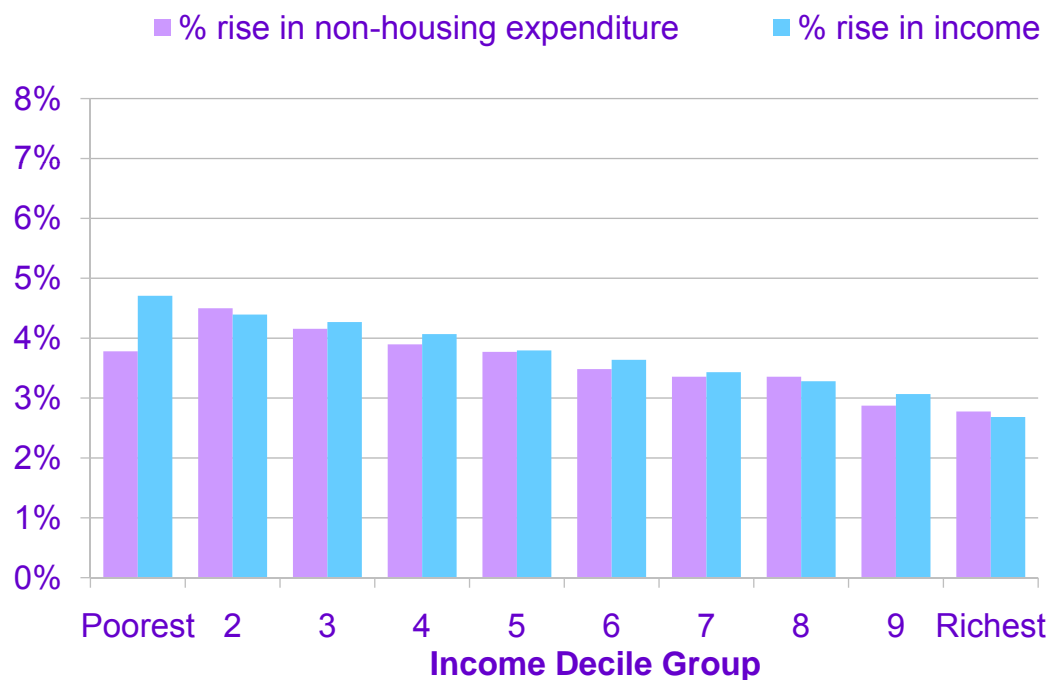
## VAT in the UK

- UK zero-rates most food, water, reading matter, children's clothes,...
  - Clearly for distributional, not efficiency, reasons → should be ended
  - Other countries show that it is not inevitable
- Reduced rate on domestic fuel looks particularly bad given environmental concerns
- Exemptions violate *both* of our principles

## Broadening the VAT base

- We simulate removing almost all zero and reduced rates
- Raises £24bn (with a 17.5% VAT rate) if no behavioural response
- Reduces distortion of spending patterns
  - With responses we find, could (in principle) compensate every household and have about £3-5bn welfare gain
- On its own base broadening would be regressive and weaken work incentives
- Can a practical package avoid this?

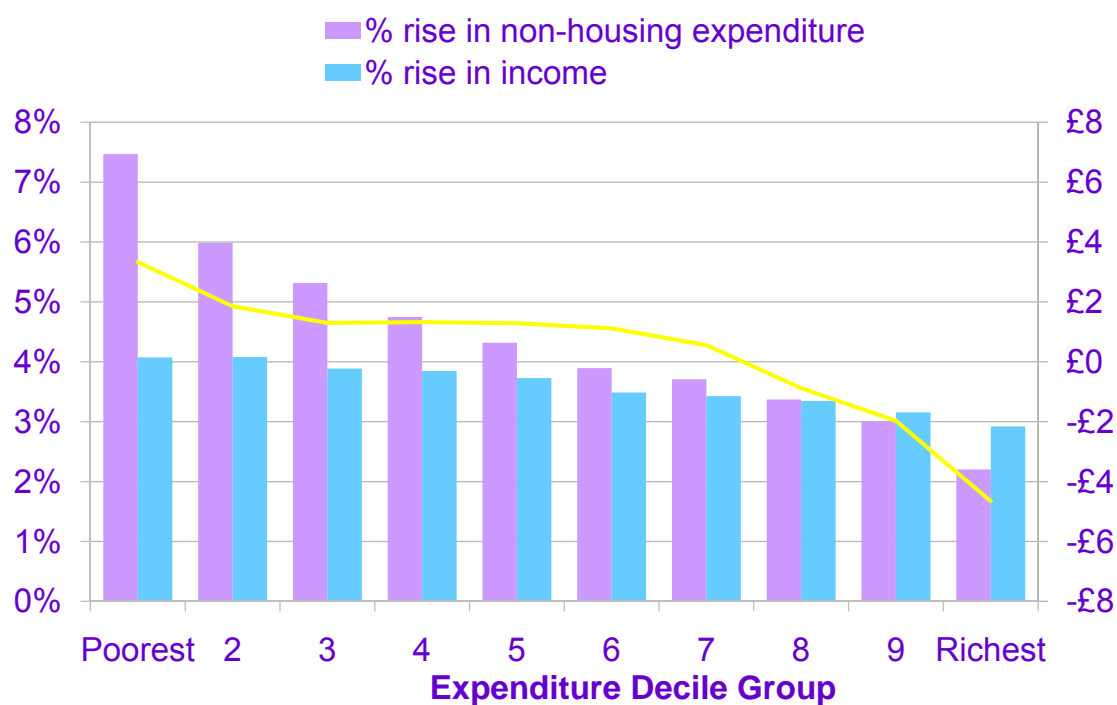
## VAT reform: effects by income



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## VAT reform: effects by expenditure

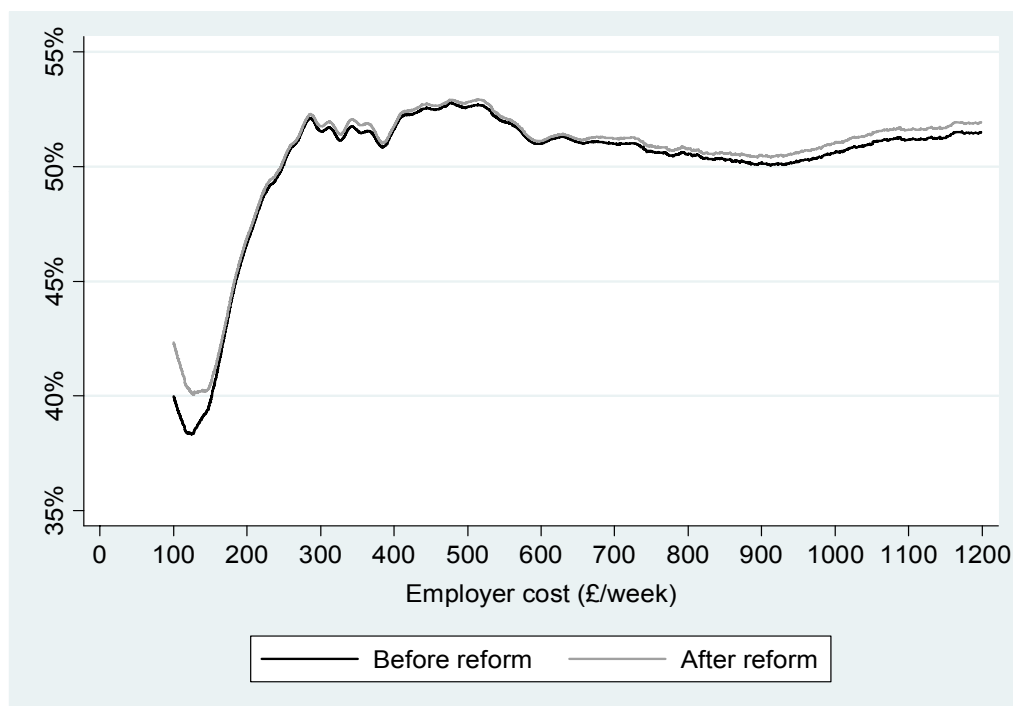


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# VAT reform: incentive to work at all

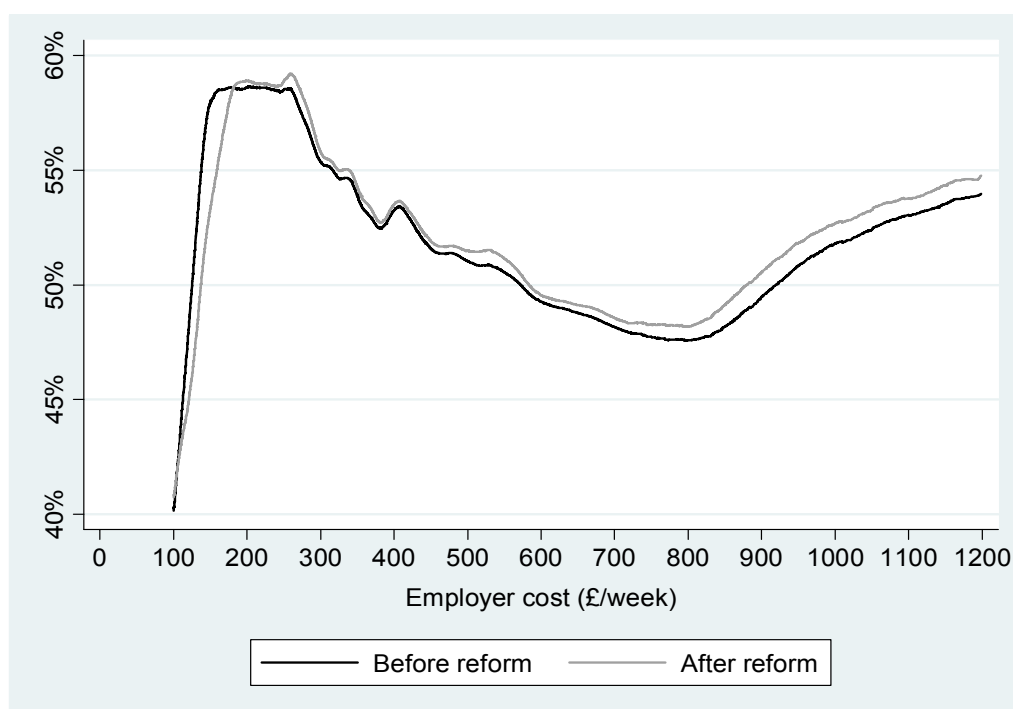
Participation tax rates



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# VAT reform: incentive to increase earnings

Effective marginal tax rates

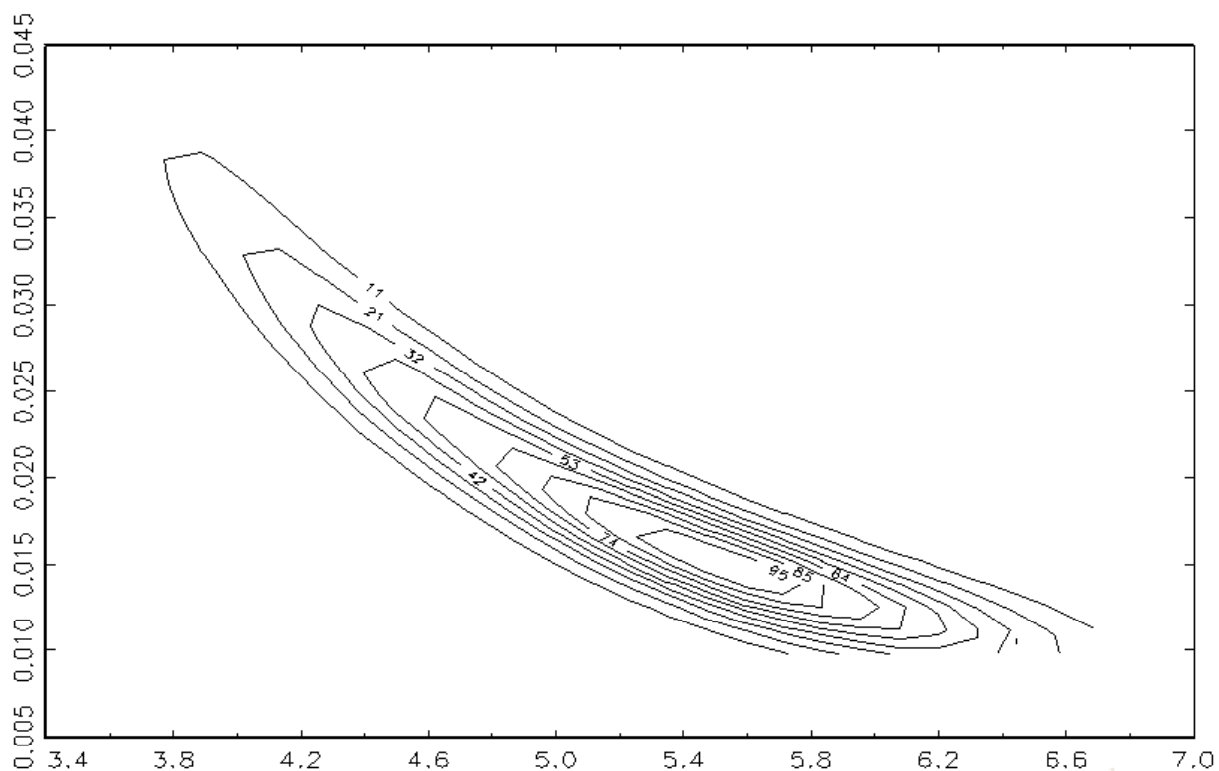


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## Broadening the base of indirect taxation

- Empirical results suggest current indirect tax rates do not line up with any reasonable justification and are a poor way of delivering redistribution given the other tax instruments available
  - Interpretation of results is that we can implement a reform package manages to achieve compensation while also avoiding significant damage to work incentives.
  - On average the *EMTR* rise by less than a quarter of a percentage point and the *PTR* by less than half a percentage point.
  - little change in work incentives at any earnings level
- Quite sizable welfare gains from removing distortions =>

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



Source: MR11

## Guiding Principles on taxation of savings

- Minimise distortions to decisions about when to consume
- Life-cycle perspective: saving = deferred consumption
- Treat different forms of saving and investment in similar ways
- Avoid sensitivity to rate of inflation

## The Taxation of Saving

- Organising principal around which we begun was the 'expenditure tax' as in Meade/Bradford but with adaptations
  - coherent approach to taxation of earnings and savings over the life-cycle – lifetime base
  - provides a framework for the integration of capital income taxation with corporate taxation
  - capital gains and dividends treated in the same way and overcomes 'lock-in' incentive from CGT
  - can incorporate progressivity and captures excess returns

## The Taxation of Saving

- taxing saving is an inefficient way to redistribute
  - assuming that the decision to delay consumption tells us nothing about ability to earn
- implies zero taxation of the normal return to capital
  - can be achieved through various alternative tax treatments of savings
  - but not a standard income tax

## Taxing Capital Gains

- Taxing capital gains only on realisation favours gains over cash income (even if realised gains taxed at full marginal rates)
- Tax deferral on accrued gains → lock-in effect
- Incentives to convert income into capital gains
  - complex anti-avoidance provisions
- Taxing capital gains on an accrual-equivalent basis is theoretically possible, but never implemented in practice

## Neutral Taxation of Savings

- We discuss two alternatives to a standard income tax which avoid intertemporal distortion
  - expenditure tax
  - (Normal) Rate of Return Allowance
- Broadly equivalent and treat cash income and capital gains equally - avoid sensitivity to inflation
- Expenditure tax (EET)
  - tax relief for inflows, tax all outflows, cf. pensions
- Rate of Return Allowance (RRA)
  - no tax relief for inflows, tax relief for normal component of returns, cf. similar to an ACE corporation tax, captures 'excess returns'

## Fraction of wealth held in different tax treatments in UK

Decile of gross financial wealth	Range of gross financial wealth (£'000s)	Proportion of wealth held in:		
		Private pensions	ISAs	Other assets
Poorest	<1.7	0.126	0.091	0.783
2	1.7–16.6	0.548	0.138	0.315
3	16.6–39.1	0.652	0.110	0.238
4	39.1–75.9	0.682	0.108	0.210
5	75.9–122.3	0.697	0.079	0.223
6	122.3–177.2	0.747	0.068	0.185
7	177.2–245.4	0.781	0.062	0.157
8	245.4–350.3	0.818	0.046	0.136
9	350.3–511.2	0.790	0.057	0.153
Richest	>511.2	0.684	0.044	0.273
All		0.736	0.055	0.209

Source: ELSA, 2004 – at least one member aged 52-64

## Unfortunately...

Conditions for zero rate on normal return can fail if:

1. Heterogeneity (e.g. high ability people have higher saving rates)
  - new evidence and theory, Banks & Diamond (MRI); Laroque, Gordon & Kopczuk; Diamond & Spinnewijn; ...
2. Earnings risk and credit constraints
  - new theory and evidence on earnings ability risk, Golosov, Tsyvinski & Werning; Blundell, Preston & Pistaferri; Conesa, Kitao & Krueger
  - e.g. keep wealth low to reduce labour supply response, weaken incentive compatibility constraint
3. Outside (simple) life-cycle savings models
  - myopia; self-control problems; framing effects; information monopolies
4. Non-separability (timing of consumption and labour supply)
5. Evidence suggests a need to adapt standard expenditure tax arguments

## But correct some of the obvious defects:

- Capture excess returns and rents
  - move to RRA(TtE) or EET where possible – neutrality across assets
  - TEE limited largely to interest bearing accounts
  - Lifetime accessions tax across generations, if practicable.
- Pensions - allow some additional incentive to lock-in savings
  - twist implicit retirement incentives to later ages
  - current tax free lump sum in UK is too generous and accessed too early



## Interaction with Corporate Taxation

- A progressive rate structure for the shareholder income tax, rather than the flat rate proposed by GHS in MRI
  - with progressive tax rates on labour income, progressive rates are also required on shareholder income to avoid differential tax treatments of incorporated and unincorporated firms
  - a lower progressive rate structure on shareholder income than on labour income reflects the corporate tax already paid
- Suitable rate alignment between tax rates on corporate income, shareholder income and labour income
  - exempt normal rate to give neutrality between debt and equity

## The shape of the reform package:

- Reforms to the income tax / benefit rate schedule
  - Introduce a single integrated benefit
  - Apply lessons from empirical evidence on response elasticities
- Broaden VAT base
  - VAT on financial services, food and clothing
- Capture excess returns and rents
  - move to RRA(TtE) or EET where possible – neutrality across assets
  - TEE limited largely to interest bearing accounts
- Pensions - allow some additional incentive to lock-in savings
  - twist implicit retirement incentives to later ages

# Empirical Evidence and Tax Reform: 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>

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