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

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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. Knowledge 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, savings and indirect tax reform as a leading examples

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

Editorial Team

Chairman: Sir James Mirrlees

Tim Besley (LSE, Bank of England & IFS)

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The Mirrlees Review

- Review of tax design from first principles
  – For modern open economies in general
  – For the UK in particular
- Two volumes:
  - 'Dimensions of Tax Design': a set of 13 chapters on particular areas co-authored by IFS researchers + international experts, 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

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

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*

Why another Review?

Changes in the world

- Capital income harder to tax (globalisation)
- Challenges to indirect taxes (VAT fraud, IT)
- Policymakers have new objectives (environment)
- Changing institutional environment/players (ECJ)
- Demographic change (ageing, lone parenthood)

Why another Review?

Changes in our understanding

- More micro-data and better methods
- Simulation models
- Developments in tax design theory
- Dynamic fiscal policy
- Political economy
- Behavioural economics

Why another Review?

Increased empirical knowledge – some examples

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

Empirical Evidence and Tax Policy Design

1. Key margins of adjustment to tax reform
2. Knowledge of effective tax rates
3. The importance of information, complexity and salience
4. Evidence on the size of responses
5. Implications for tax design

Here I will focus on earnings, savings 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

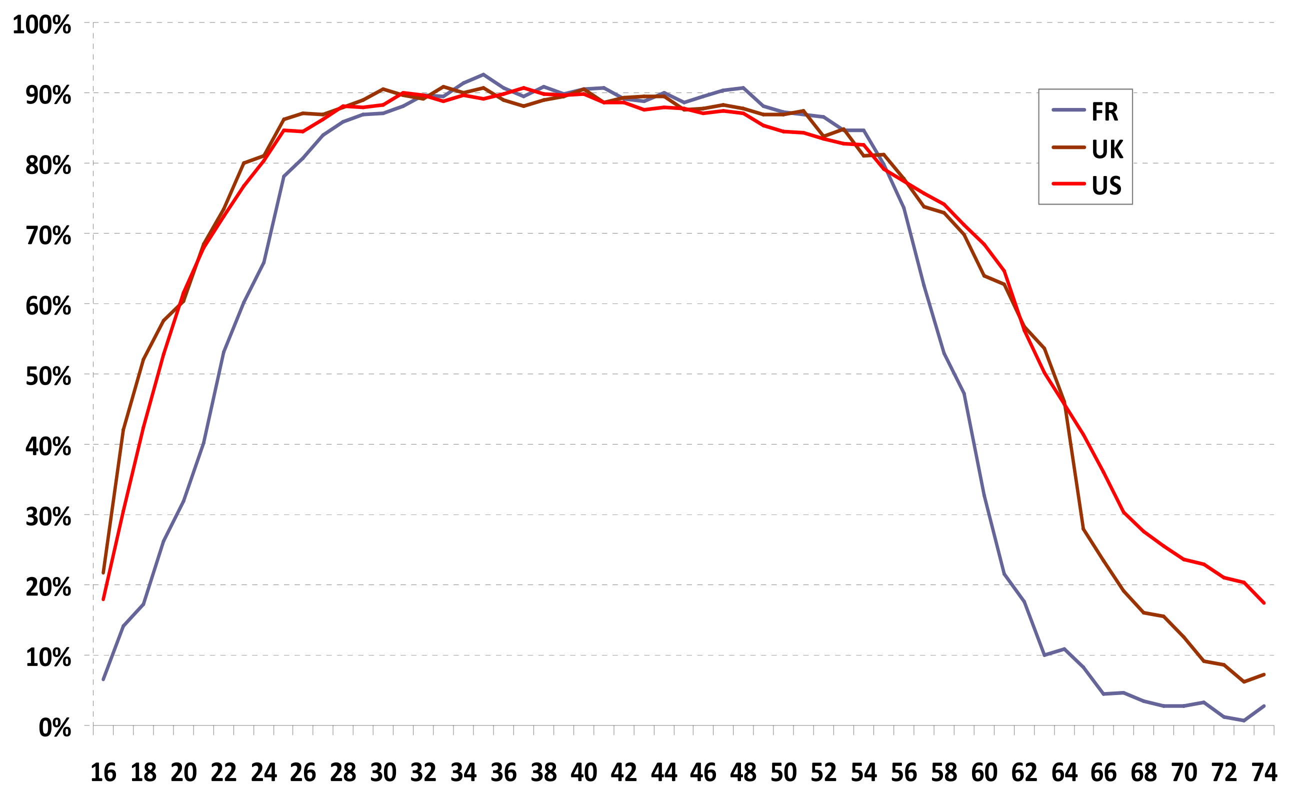
Key Margins of Adjustment to Tax Reform

- Intensive and extensive margins of labour supply
- Taxable income and forms of remuneration
- Savings-pension portfolio mix
- Consumer demand mix
- Housing equity
- Human capital
- Organisational form
- Debt-equity mix for companies
- Company/R&D location

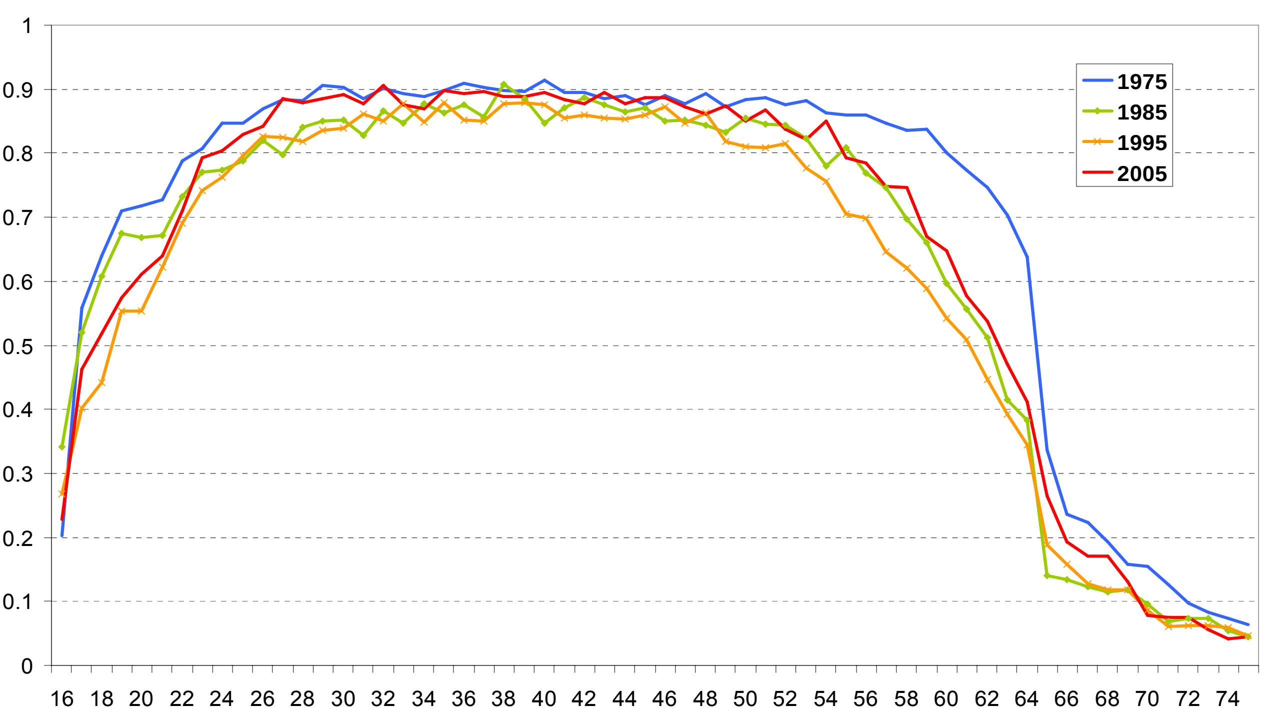
Key Margins of Adjustment to Tax Reform

- Extensive and intensive margins of labour supply
- What do they look like?
  - Getting it right for men

Male Employment by age – US, FR and UK 2007

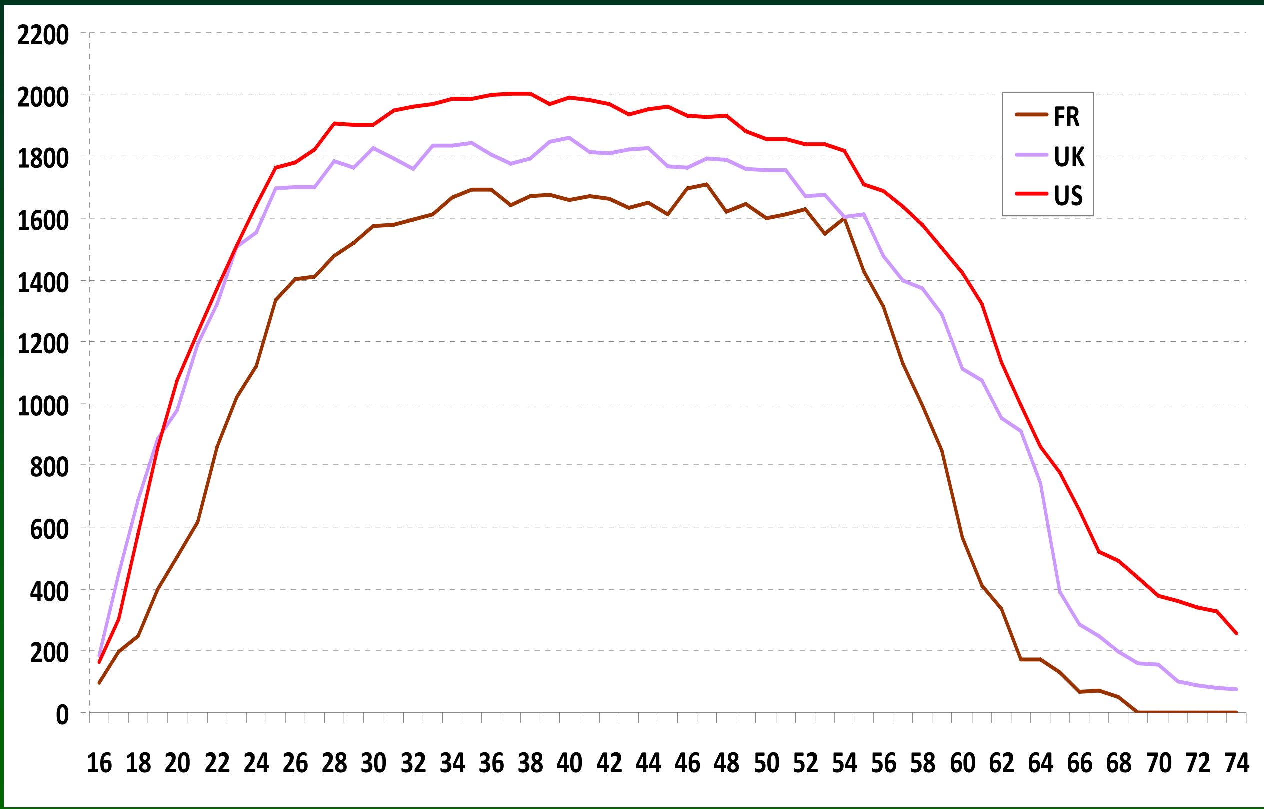


Male Employment by age UK: 1975 - 2005



Data: UK LFS.

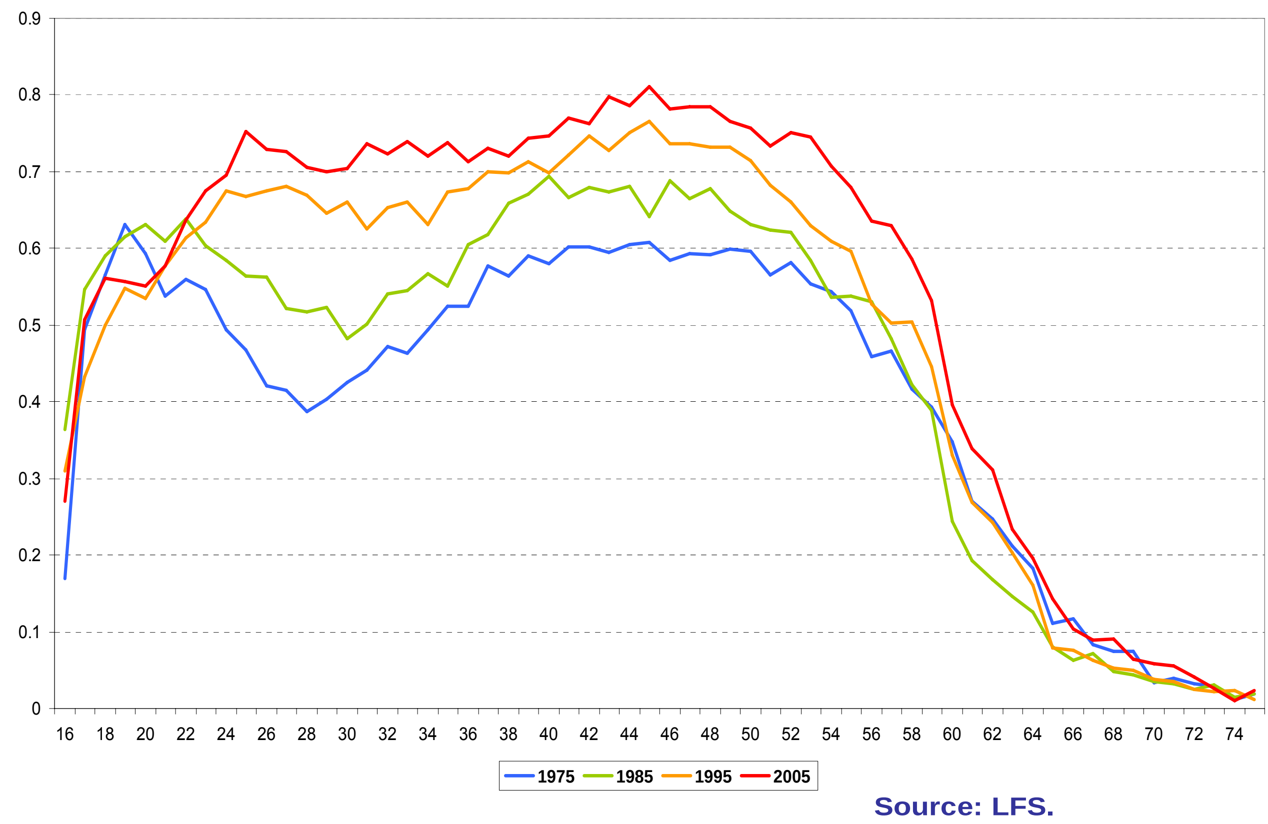
Male Hours by age – US, FR and UK 2005



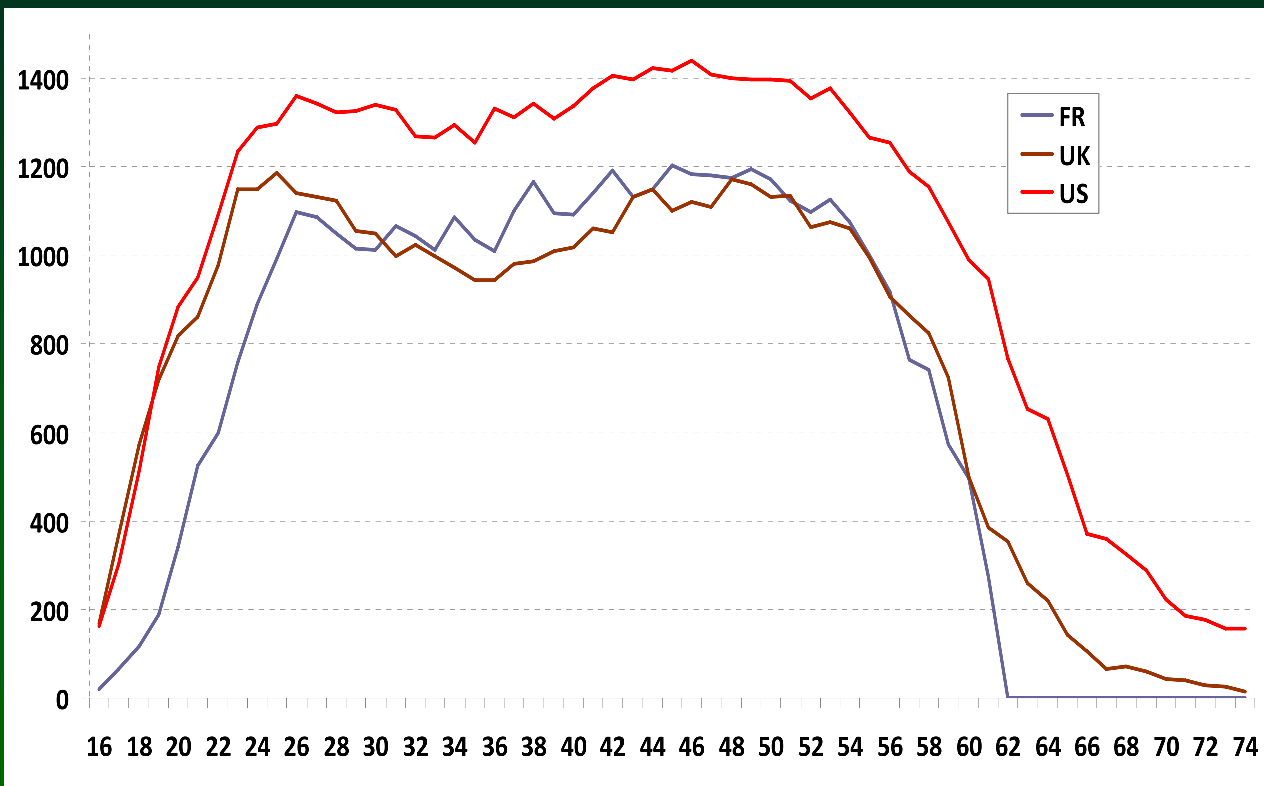
Key Margins of Adjustment to Tax Reform

- Extensive and extensive margins
- What do they look like?
  - Female employment and hours

Female Employment by age in the UK – 1975 - 2005



Female Hours by age – US, FR and UK 2005



Why is this important for tax design?

Implications for Tax Rates on Earnings

1. Suggests where should we look for responses to tax reform.
2. Some key lessons from recent tax design research (Saez,..)

- Importance of extensive labour supply margin (at the bottom)
- A 'large' extensive elasticity can 'turn around' the impact of declining social weights
  - implying a higher transfer to low wage workers than to those out of work
  - a role for tax credits

3. But how do individuals perceive the tax rates on earnings implicit in the tax credit and benefit system?
   - are individuals more likely to take-up if generosity increases?
   - how does labour supply in couples respond?
4. Importance of margins other than labour supply (at the top)
   - taxable income elasticities

Top incomes and taxable income elasticities

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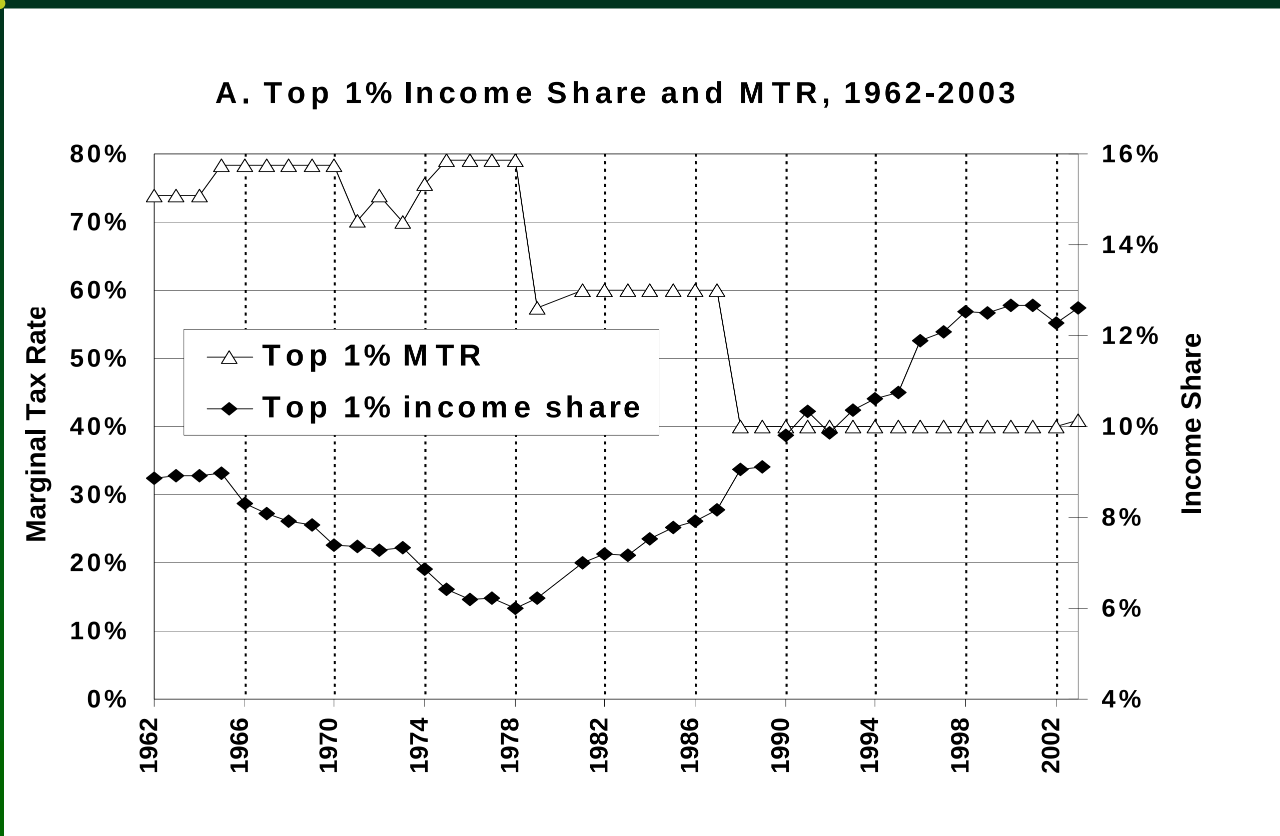


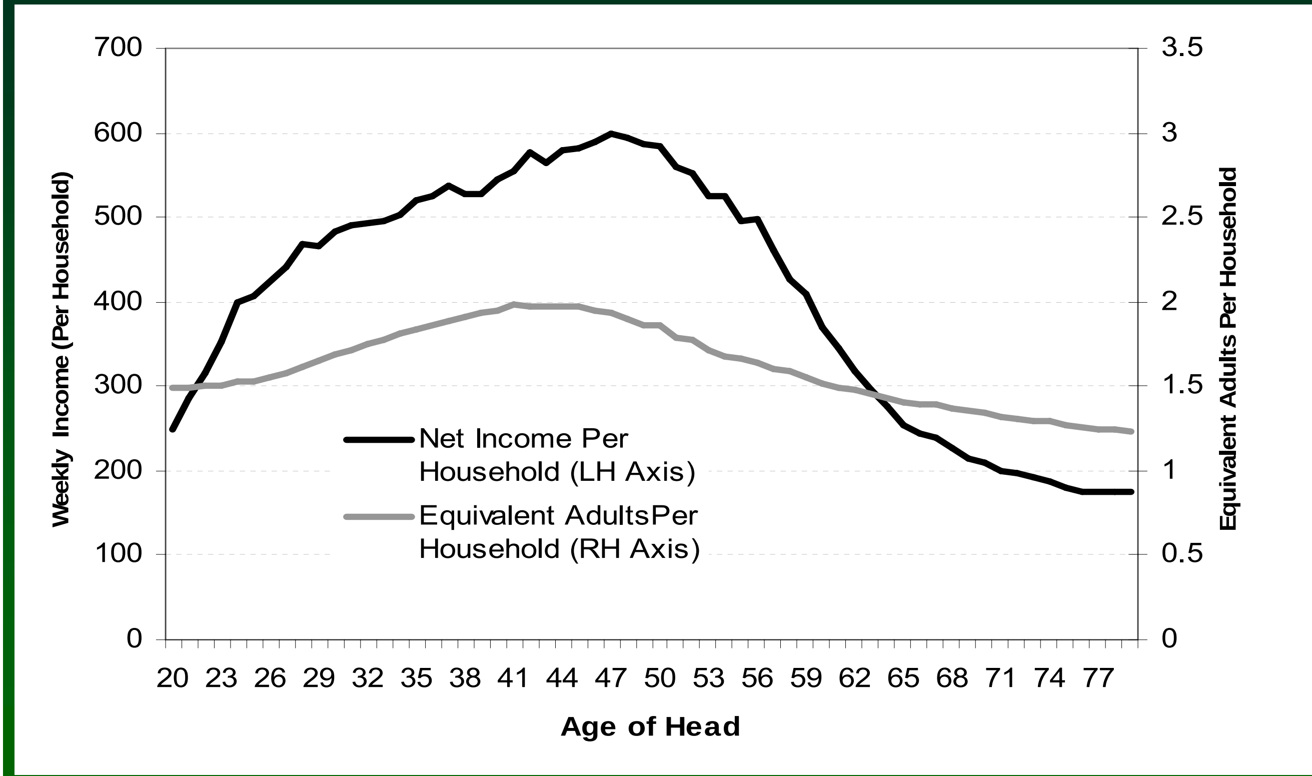
Key Margins of Adjustment

- 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
- **Look in the Review documents….**

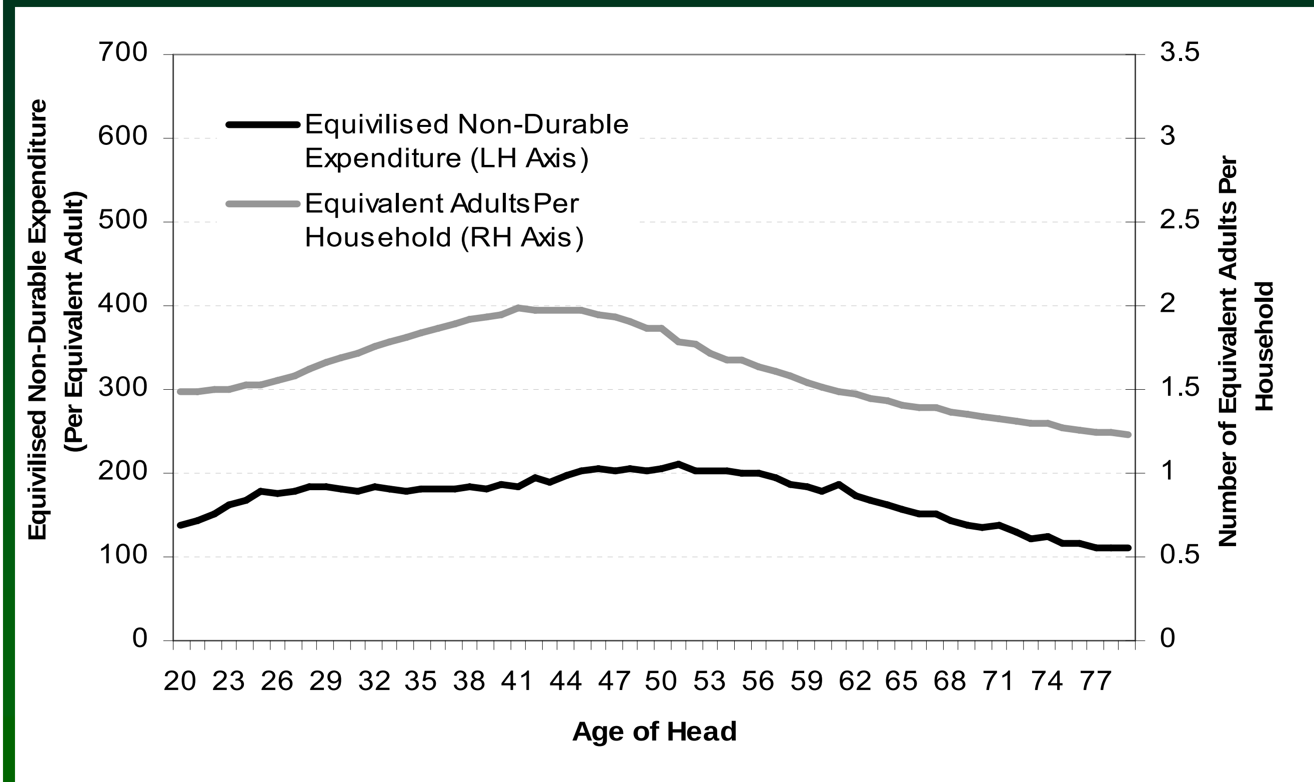
Savings and Pensions

- When the life-cycle model works
  - How much life-cycle consumption/needs smoothing goes on?

Net Income, Number of Equivalent Adults per Household



Consumption and Needs



Savings and Pensions

- When does the life-cycle model work?
  - How much life-cycle consumption/needs smoothing goes on?
    - recent work on permanent and transitory shocks to income across the wealth distribution
  - How well do individuals account for future changes in reforms with today's decisions – a few examples
    - Attanasio & Rohwedder (*AER*) on UK pension reform announcements
  - Intergeneration transfers - Altonji, Hayashi & Kotlikoff, etc
- Other issues around intertemporal responses
  - Temporal preferences, ability and cognition
    - Banks and Diamond (MRI chapter), Diamond and Spinnewijn (MIT)
- Impact of earnings uncertainty
  - Key periods in life-cycle and business cycle
  - Role in dynamic fiscal policy arguments for capital taxation

Demand responses

- Two key observations:
- Non-separabilities with labour supply are important
  - especially in childcare and work related expenditures
  - updated evidence in MR
- Price elasticities differ with total expenditure/wealth
  - responses and welfare impact differs across the distribution
  - new evidence published in Ecta last year

Implications for Reform

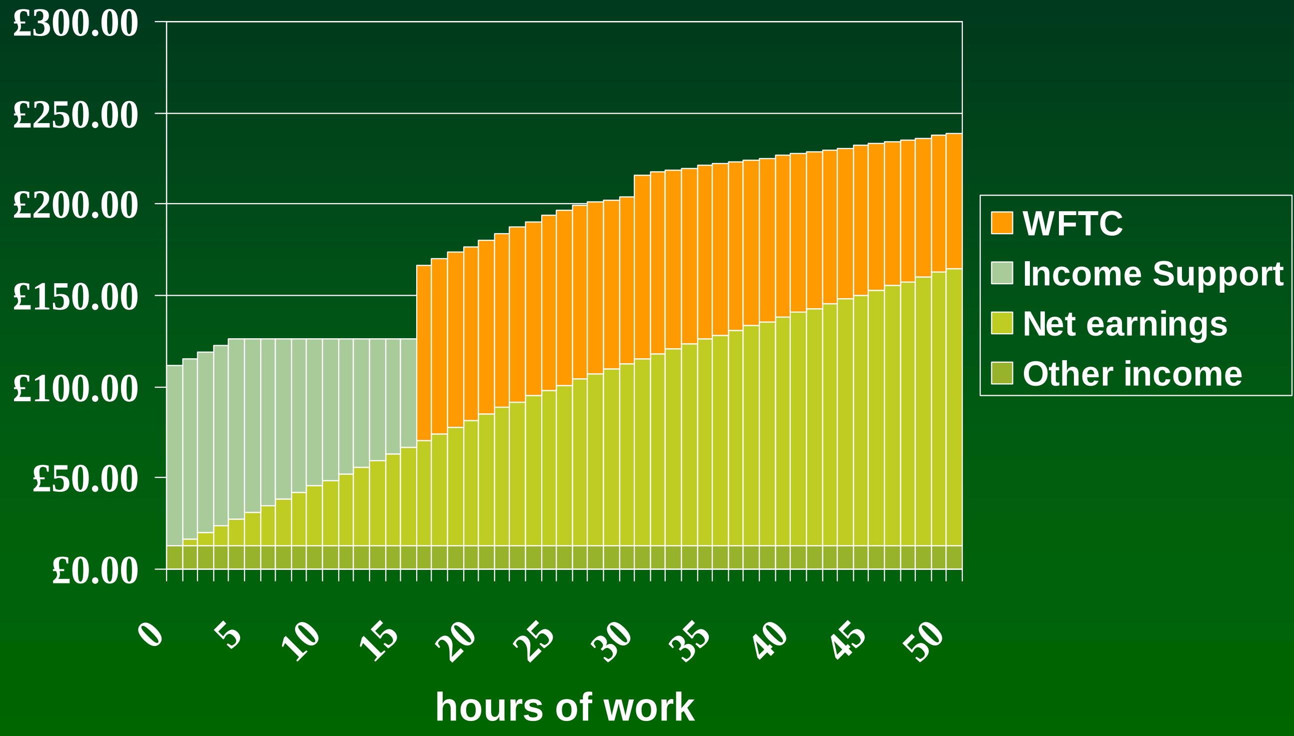
- Tax Rates on Earnings
- Corporate Taxation
- Taxation of Savings
- Indirect Taxation
- An integrated and revenue neutral analysis of reform…

Tax rates on lower incomes

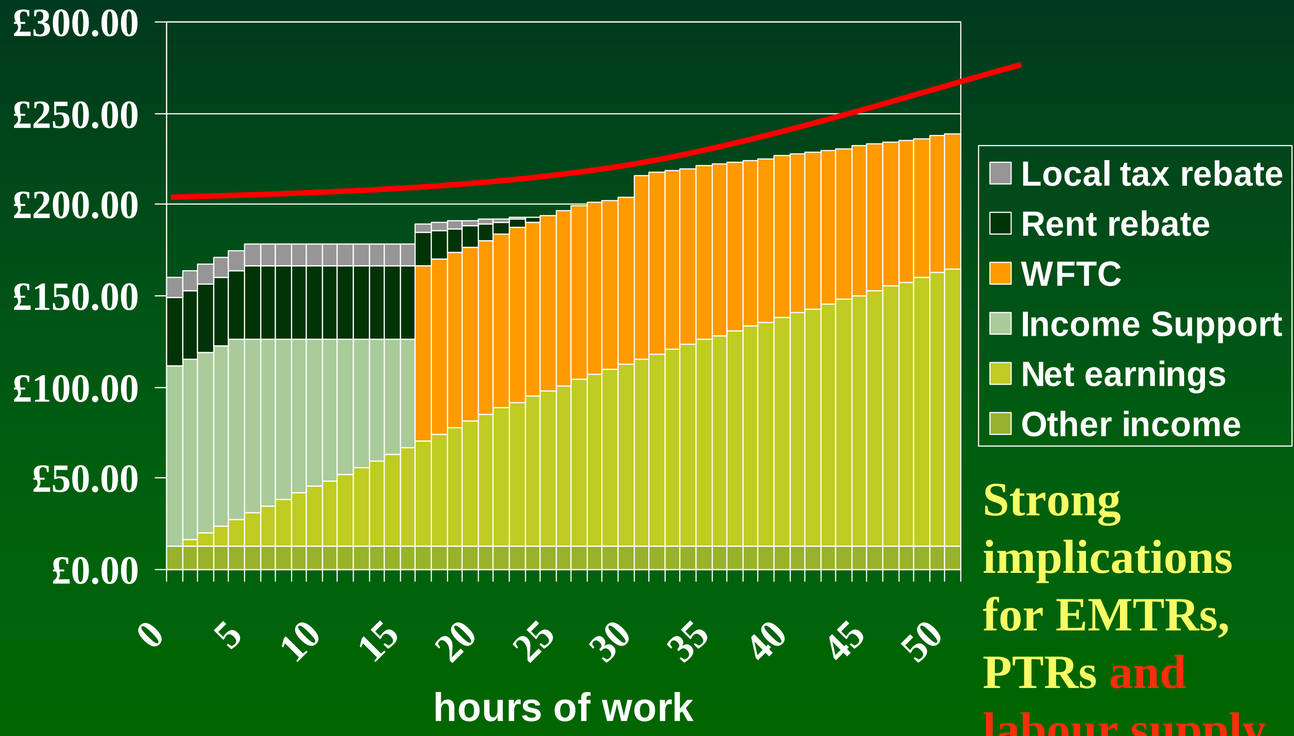
Main defects in current welfare/benefit systems

- Participation tax rates at the bottom remain very high in UK and elsewhere
- Marginal tax rates in the UK are well over 80% for low income working families because of phasing-out of means-tested benefits and tax credits
  - Working Families Tax Credit + Housing Benefit + etc
  - and interactions with the income tax system
  - For example, we can examine a typical budget constraint for a single mother…

The interaction of WFTC with other benefits in the UK



The interaction of WFTC with other benefits in the UK



Strong implications for EMTRs, PTRs and labour supply

What about the size of labour supply responses?

Structural Model Elasticities – lower educated lone parents

(a) Youngest Child Aged 11-18

Earnings	*Density*	*Extensive*	*Intensive*
0	0.3966		
80	0.1240	0.5029	0.5029
140	0.1453	0.7709	0.3944
220	0.1723	0.7137	0.2344
300	0.1618	0.4920	0.0829
Participation elasticity		1.1295	

Similar strong extensive margin responses for men in 'pre-retirement' period using structural retirement models and for married women with children.

Blundell and Shephard (2008)

What about the size of labour supply responses?

Structural Model Elasticities – lower educated lone parents

(c) Youngest Child Aged 0-4

Earnings	*Density*	*Extensive*	*Intensive*
0	0.5942		
80	0.1694	0.2615	0.2615
140	0.0984	0.6534	0.1570
220	0.0767	0.5865	0.1078
300	0.0613	0.4984	0.0834
Participation elasticity		0.6352	

Differences in intensive and extensive margins by age and demographics have strong implications for the design of the tax schedule... But how reliable are our structural models?

WFTC Reform 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.

Outcome: employment. Average impact x 100, employment percentage.

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

Drop: Summer 1999 – Spring 2000 inclusive

Structural Simulation of the WFTC Reform:

WFTC Tax Credit Reform

	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:	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*

– ‘large’ impact relative to quasi-experiment results

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

Blundell and Shephard (2008)

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*

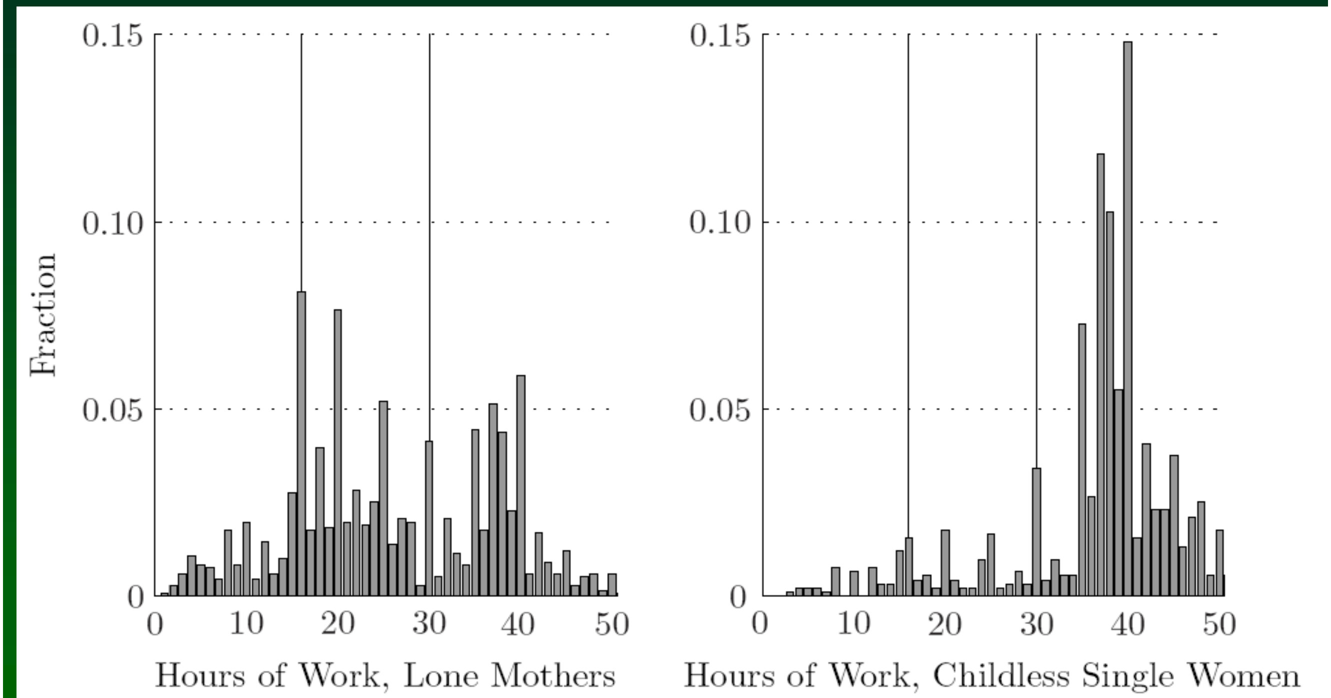
- matches with the quasi-experimental results
- shows the structural model predictions are quite accurate

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

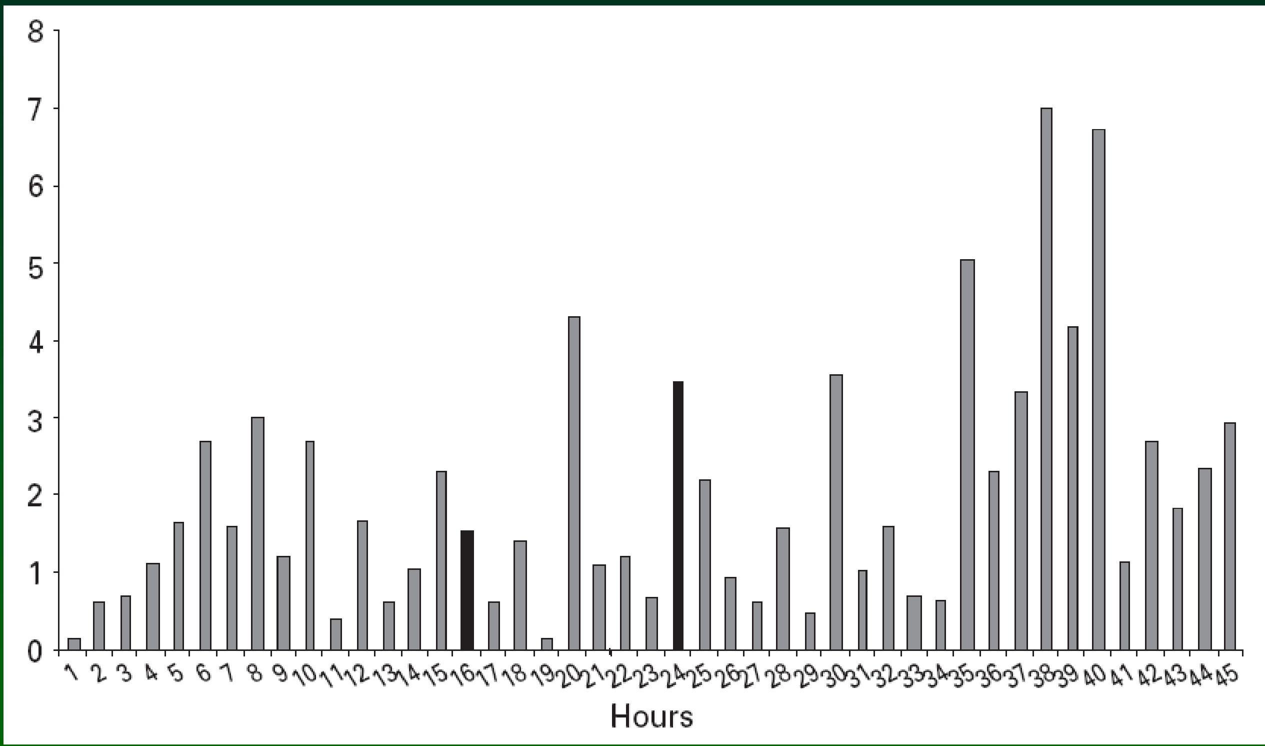
Blundell and Shephard (2008)

Can the reforms explain weekly hours worked?

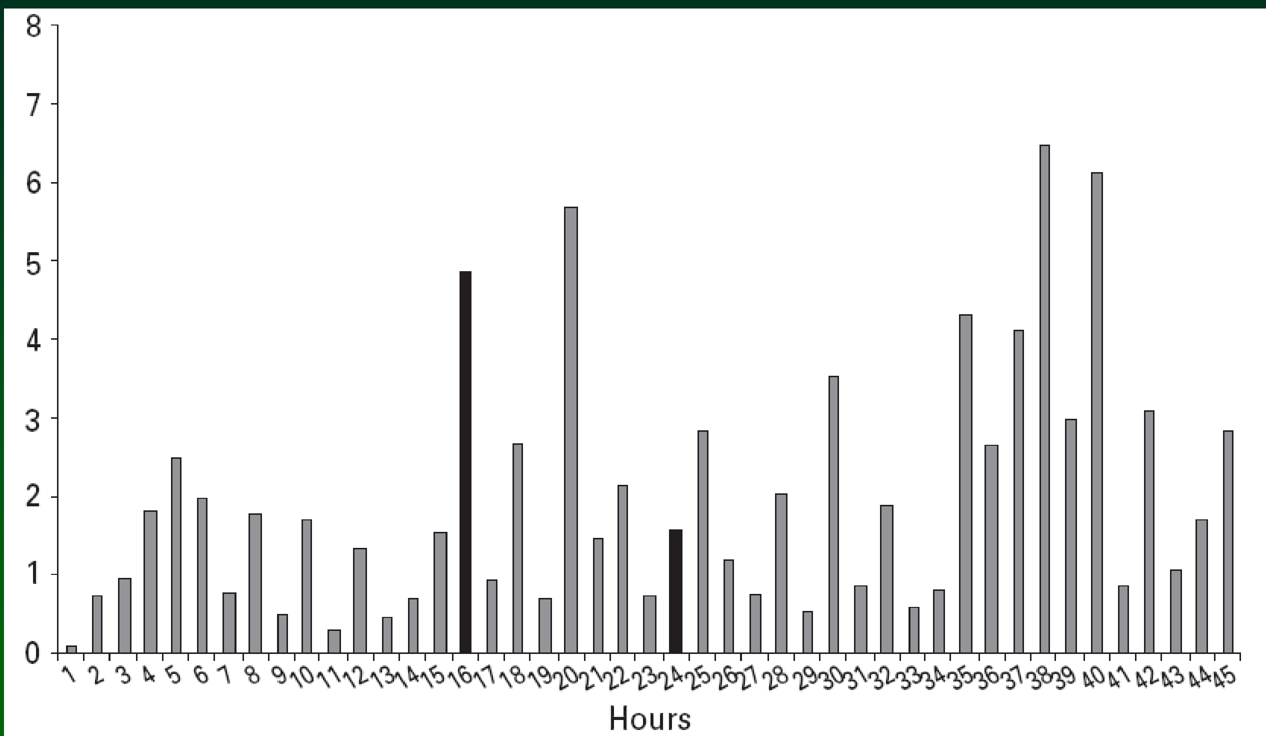
Single Women (aged 18-45) - 2002



Hours' distribution for lone parents, 1990

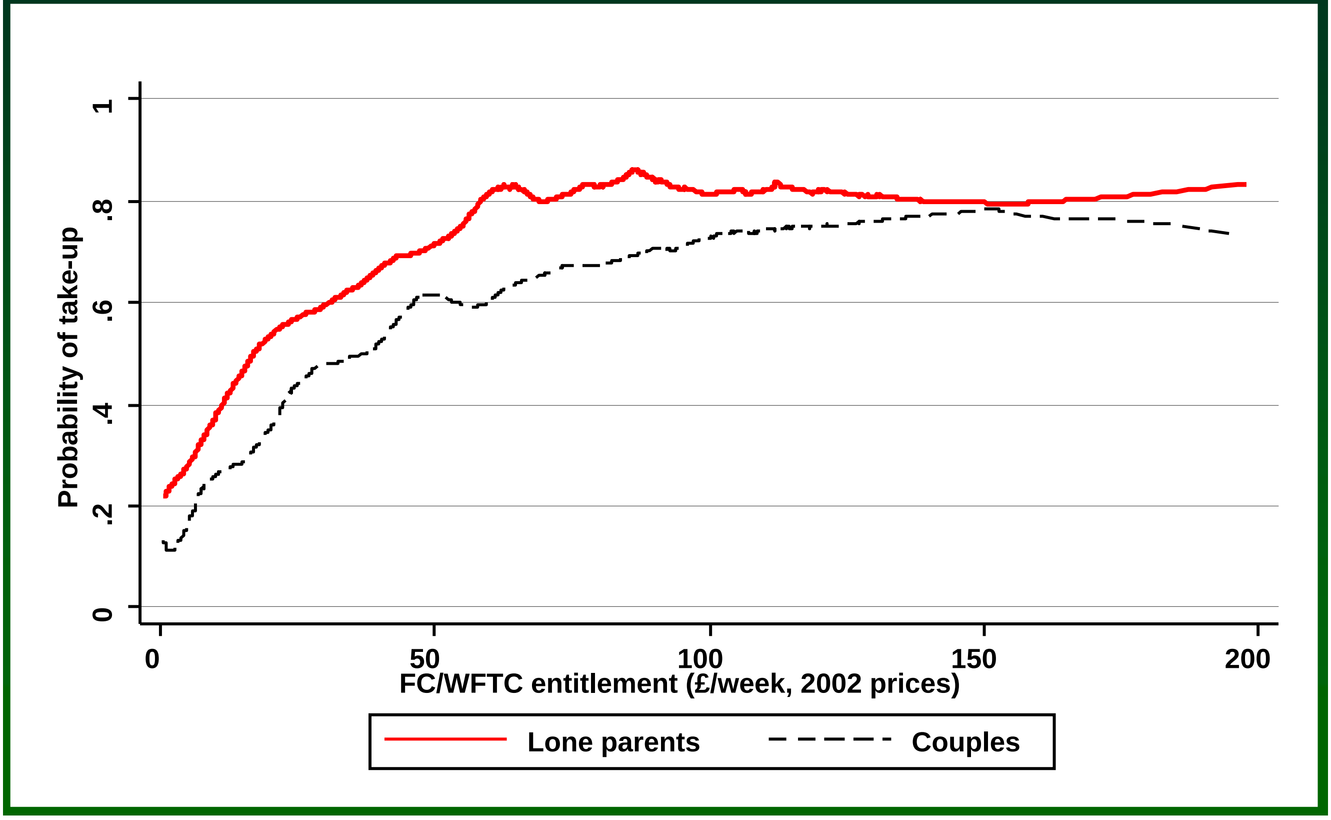


Hours' distribution for lone parents, 1993

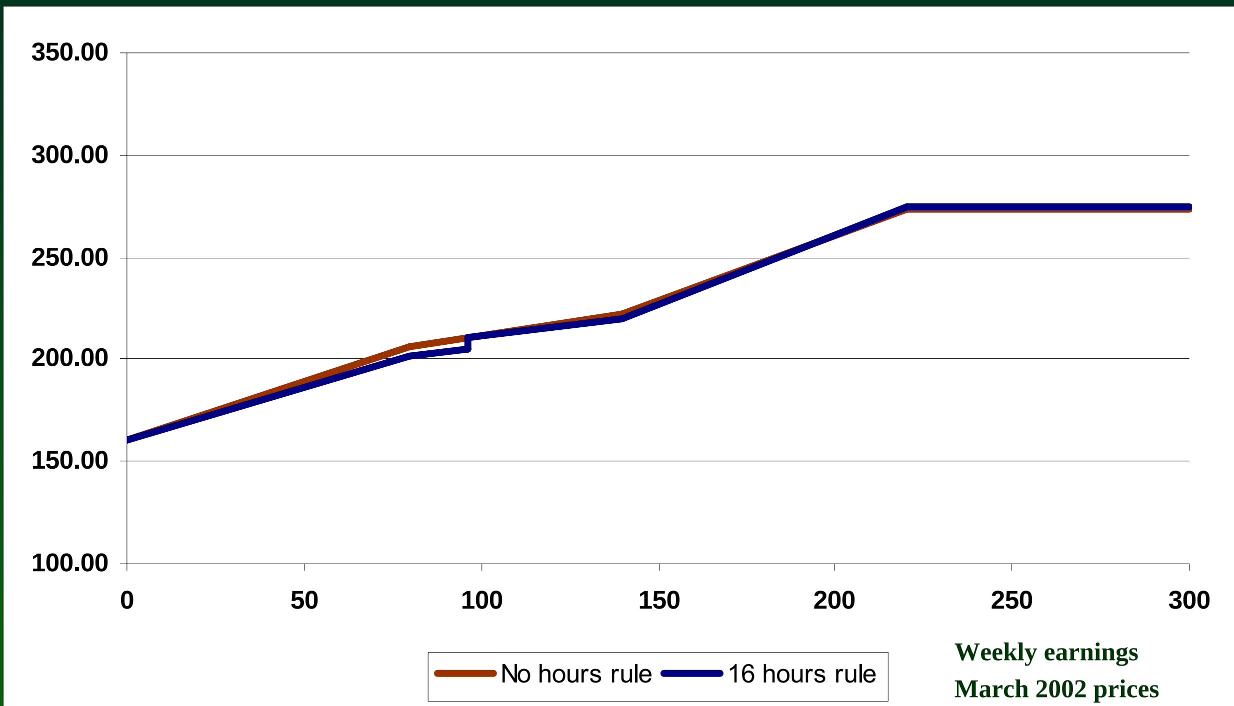


Importance of take-up and information/hassle costs

Variation in take-up probability with entitlement to FC/WFTC

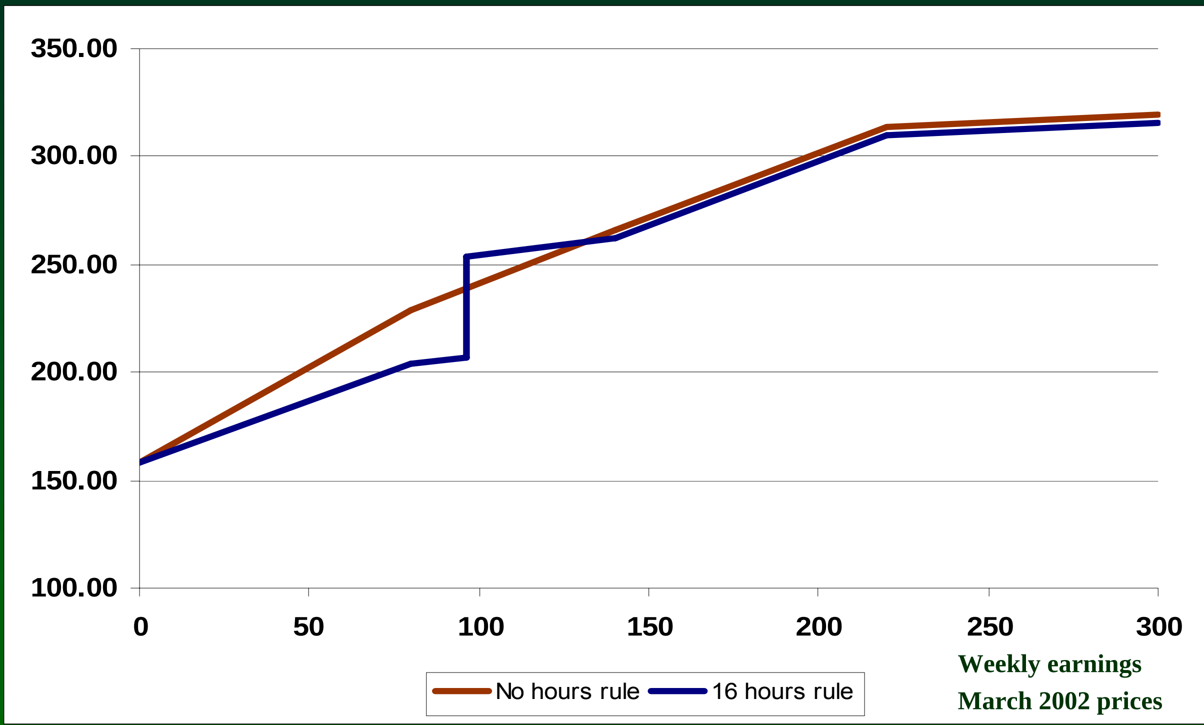


Implied Optimal Schedule, Youngest Child Aged 0-4



Blundell and Shephard (2008)

Implied Optimal Schedule, Youngest Child Aged 5-10

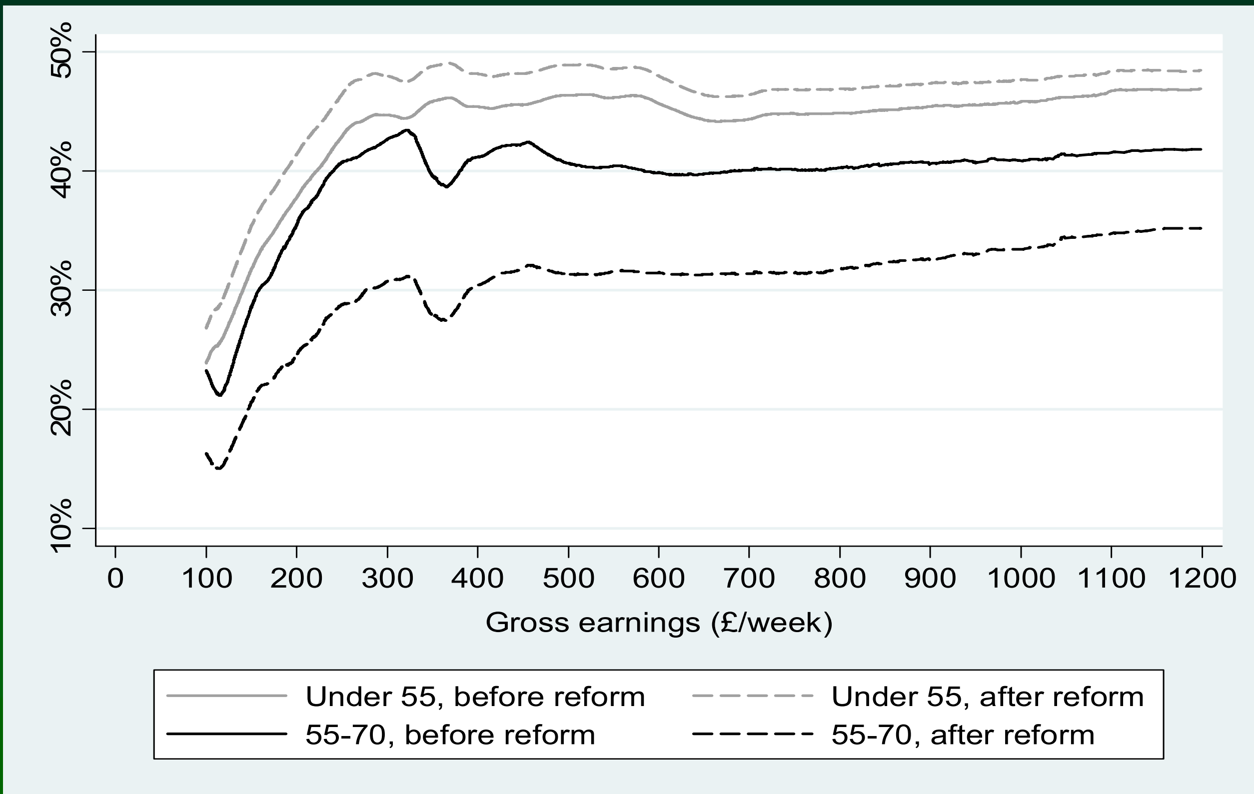


Blundell and Shephard (2008)

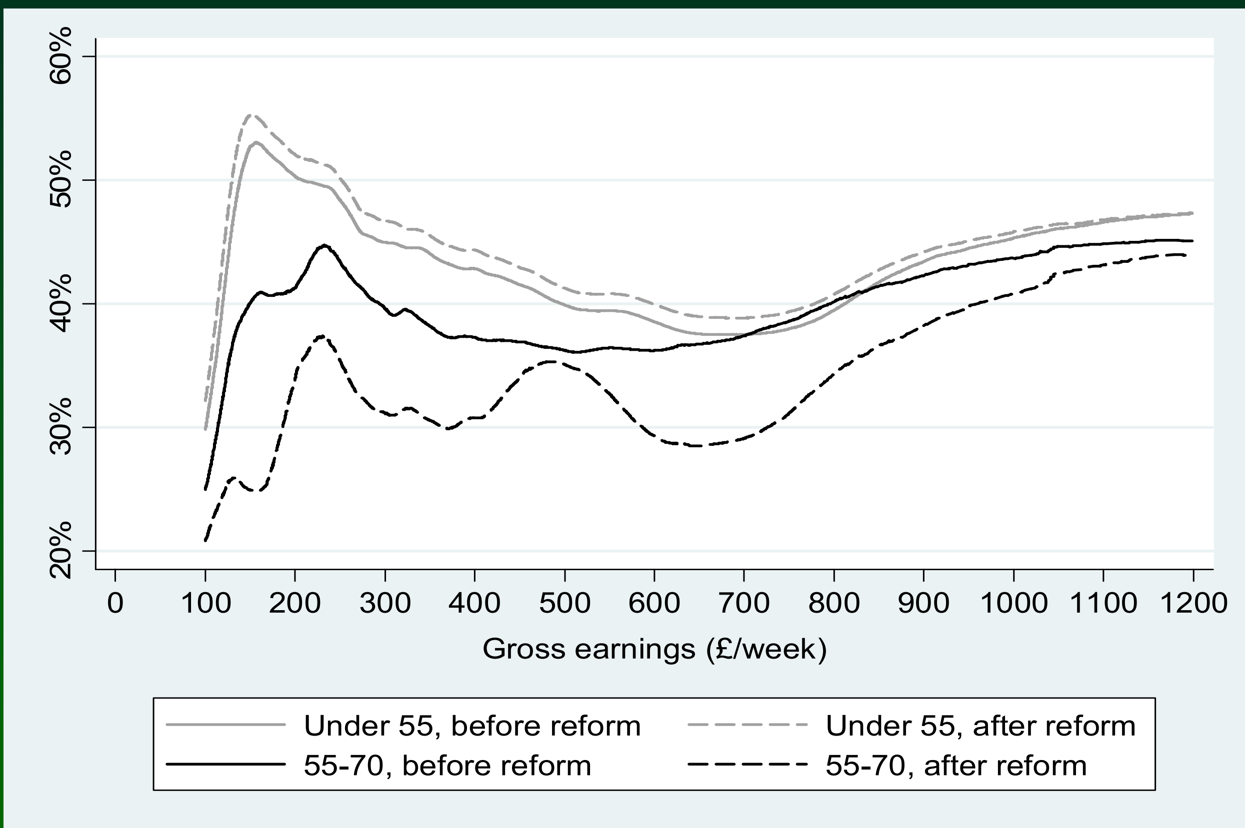
Implications for Tax Rates

- 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
    - at least for some groups
- Age-based taxation
  - distinguish by age of youngest child for mothers/parents
  - pre-retirement ages
- Impact on PTRs and EMTRs:

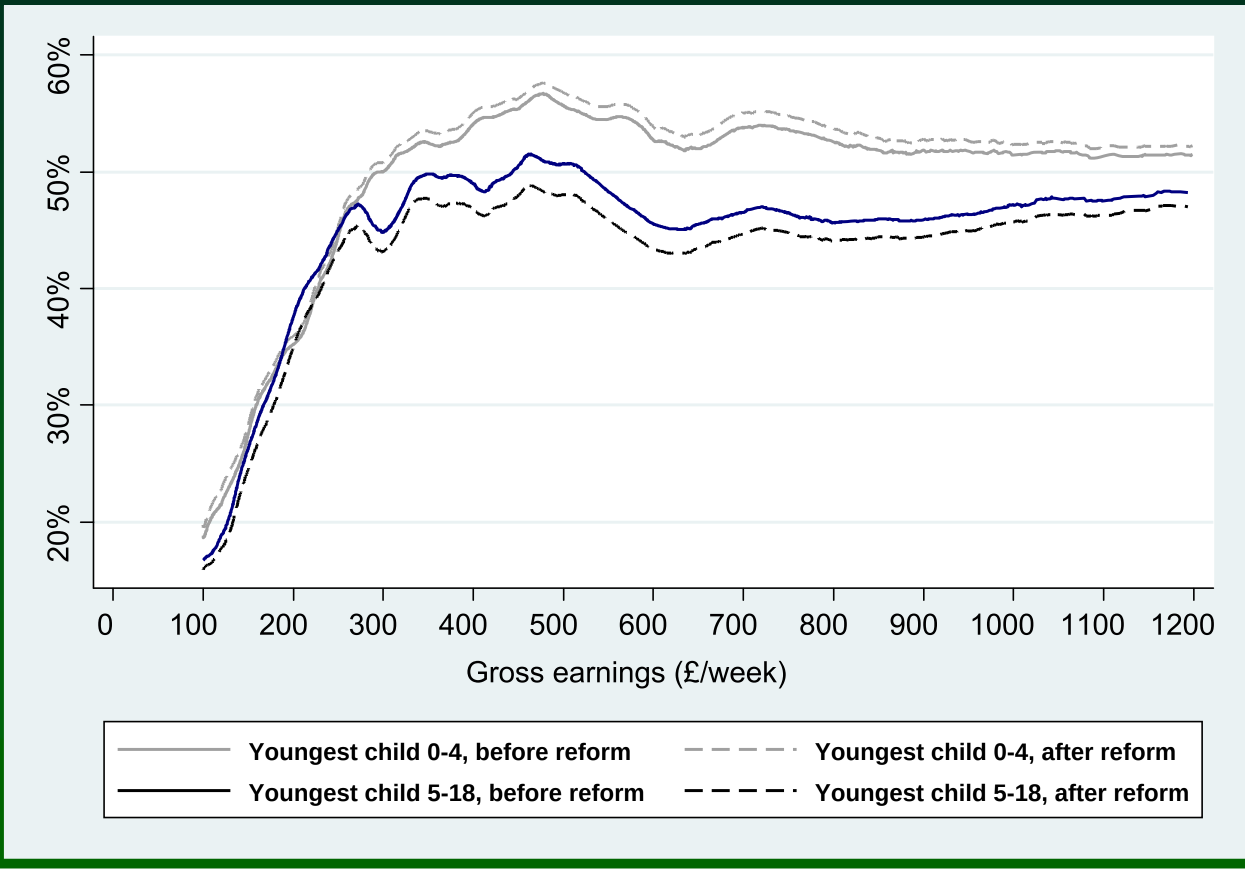
Effect of early retirement reforms on average PTRs across the earnings distribution, by age



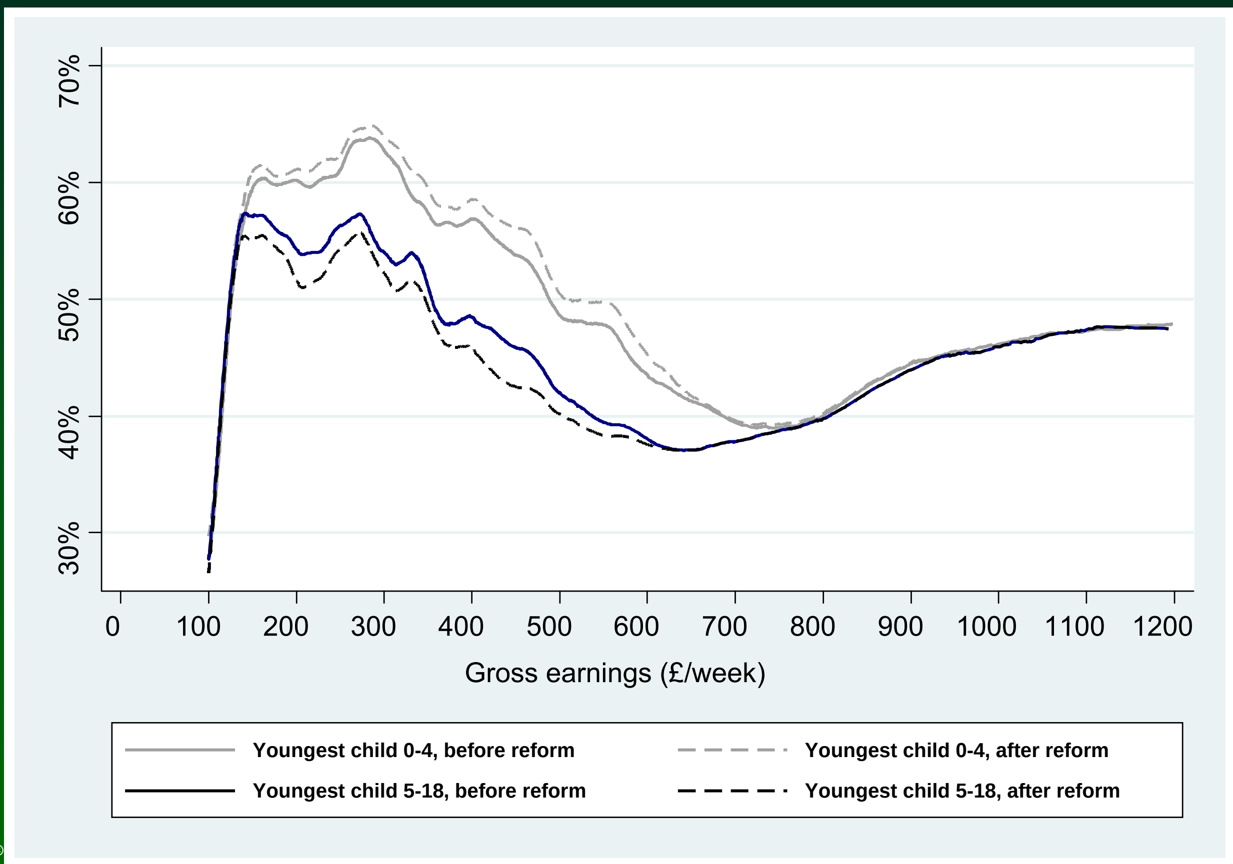
Effect of early retirement reforms on average EMTRs across the earnings distribution, by age



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



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



Implications for Tax Rates

- In fact, the child-age tax reforms increase employment by 40,000, aggregate earnings up by £.7m.
- Similar increases from pre-retirement age tax reforms.
- Retirement incentives highlight the interaction between the taxation of earnings and the taxation of savings and pensions
- Effective tax rates on earnings are a combination of the tax rate on earnings and on savings/pensions
  - Why our assumptions about intertemporal behaviour are so critical – return to this.
- What about the design of tax rates on high earnings?

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 (≈ 1.8) Pareto parameter.

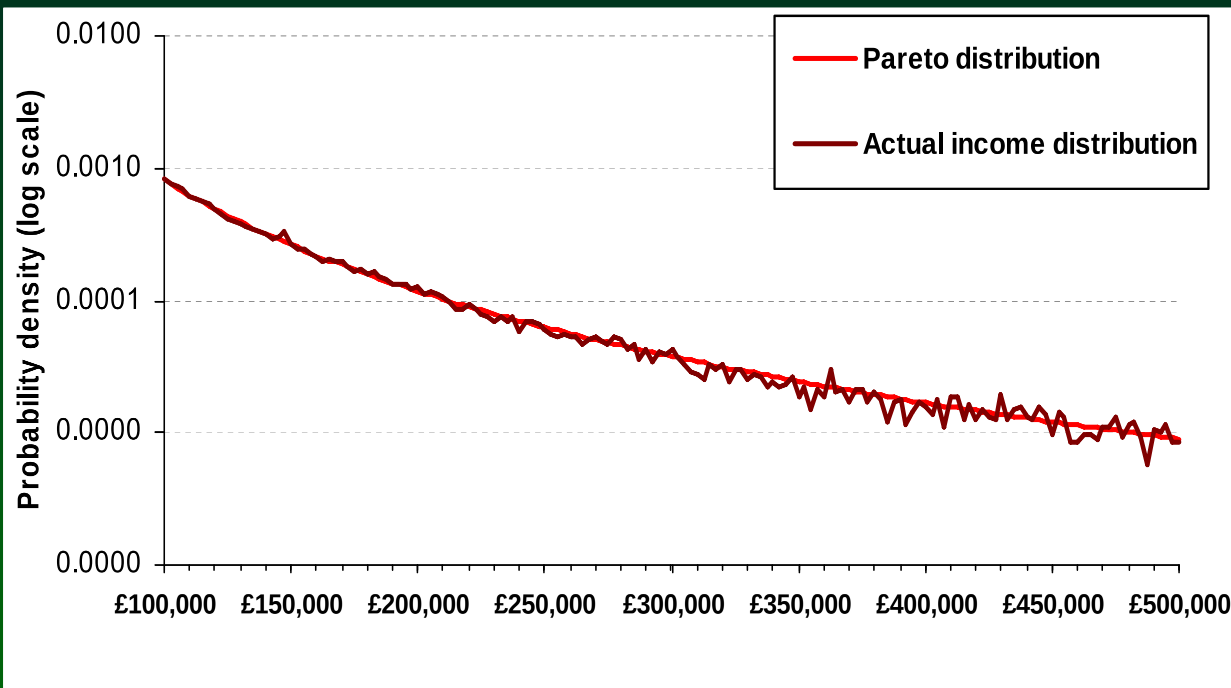
Estimate *e* from the evolution of top incomes following large top MTR reductions in the 1980s

Table: Taxable Income Elasticities at the Top

	Simple Difference	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)

Source: Brewer, Saez and Shephard (MRI, 2009)

Pareto distribution as an approximation to the income distribution



Taxable income elasticities

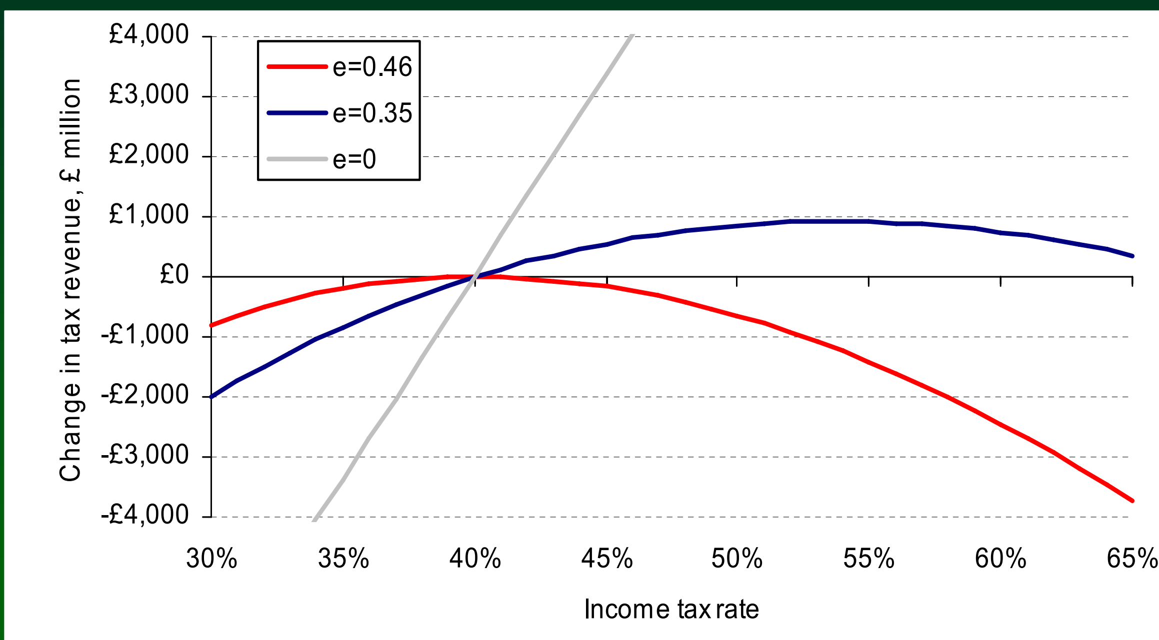
An ‘optimal’ top tax rate

$t = 1 / (1 + a \cdot e)$ where a (≈ 1.8) Pareto parameter.

Estimates for the UK in the range .35 - .55, central estimate of .46 quite fragile

Note the key relationship between the size of elasticity and the tax base

Change in tax receipts as a result of changing marginal income tax rate applying to the top 2% - over £150,000



Reforming Tax Rates

- Change transfer/tax rate structure to match lessons from 'new' optimal tax analysis
  - limits to tax rises at the top
    - but CGT, domicile rules, anti-avoidance - tax base reforms
  - lower marginal rates at the bottom
    - means-testing should be less aggressive
- Age-based taxation
  - distinguish by age of youngest child
  - pre-retirement ages
- Hours rules?
- Integrate IT & NICs; integrate different benefits and tax credits
  - Improve administration, transparency; facilitate coherent design and improve information and take-up
- Undo distributional effects of the rest of the package…

Corporate Taxation

- Exempt normal rate to give neutrality between debt and equity
  - move toward a source-based ACE system
  - recognising that taxing corporate rents on a destination-basis may be more attractive in the longer term, particularly if significant revenues from source-based corporate taxes eventually prove to be unsustainable
- A progressive rate structure for the shareholder income tax, rather than the flat rate proposed by GHS in MRI (a variant on the Scandinavian dual income tax approach)
  - 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 for some taxpayers

Relation to personal taxation of shareholder income

- A lower progressive rate structure on shareholder income than on labour income reflects the corporate tax already paid, so that overall tax charges are equalised
- Suitable rate alignment between tax rates on corporate income, shareholder income and labour income can deal with most of the problems highlighted in the Crawford-Freedman MRI study on small business taxation
- Note current rates on labour income (top 45%) and capital gains (18%)!

The Taxation of Saving

The organising principal around which we begun our analysis was the ‘expenditure tax’ as in Meade but with adaptations:

- forms a coherent way of bringing together the discussion of taxation over the life-cycle, of taxation of commodities, of tax rates and redistribution, and of the taxation of wealth, transfers and gifts.
- can incorporate progressivity
- 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 in income tax system
- captures excess returns

The Taxation of Saving

- Under certain conditions, the decision to delay consumption tells us nothing about ability to earn
  - taxing saving is an inefficient way to redistribute
- Implies zero taxation of the normal return to capital
  - can be achieved through a variety of alternative forms: EET, TEE, ACE/RRA/TtE
- *According to the points at which saved funds may be taxed:*
  - when income is received (i.e. before or at the point that they are paid into an asset);
  - returns (interest, capital gains or dividends) as they accrue;
  - funds when they are withdrawn from an asset

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

ETRs for basic-rate taxpayer (BRT) and higher-rate taxpayer (HRT)

Asset		Effective tax rate (%)	
		BRT	HRT
ISA (cash or stocks and shares)		0	0
Cash deposit account		33	67
Employee contribution to pension	(invested 10 years)	–21	–53
	(invested 25 years)	–8	–21
Employer contribution to pension	(invested 10 years)	–115	–102
	(invested 25 years)	–45	–40
Owner-occupied housing		0	0
Stocks and shares[b]	(invested 10 years)	10	35
	(invested 25 years)	7	33

Effective tax rates on returns to pension saving

Asset		Effective tax rate (%)
Employee contribution to a pension		
Tax rate in work	Tax rate in retirement	
Basic rate (20%)	Basic rate (20%)	–21
Higher rate (40%)	Higher rate (40%)	–53
Higher rate (40%)	Basic rate (20%)	–122
Basic rate (20%)	Pension credit taper (40%)	46
Tax credit taper (59%)	Basic rate (20%)	–260
Tax credit taper (59%)	Pension credit taper (40%)	–189

Unfortunately…

Conditions for zero rate on normal return can fail if:

1. Heterogeneity (high ability people have higher saving rates)
   – new evidence and theory Banks and Diamond (MRI), Laroque,….
2. Earnings risk (keep wealth low to reduce labour supply response, weaken incentive compatibility constraint)
   – recent new theory and evidence on earnings ability risk
3. Outside simple life-cycle savings models - credit constraints; myopia; self-control problems; framing effects; information monopolies
4. Non-separability (timing of consumption and labour supply)
5. Need to adapt standard expenditure tax….

Implications for Reform

- Move further to exempt taxation of the normal return
  - case for zero rate on normal return not robust, but optimal rate structure is hard to derive
  - use pension withdrawal incentives and age-based taxation
- But capture rents and excess returns
  - move to RRA(TtE) or EET where possible – neutrality across assets
  - TEE on interest baring 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 is too generous and accessed too early
- Housing
  - excess returns? Currently TEE in UK – difficult without LVT issues
  - add VAT style property tax on consumption (rH)
  - part of extending the indirect tax base

Indirect Taxation

- Various arguments for non-uniform taxation of commodities
- Some clear exceptions to uniformity
  - Childcare strongly complementary to paid work ➔ zero-rate
  - Alcohol, tobacco, betting, possibly unhealthy food have externality / merit good properties ➔ keep 'sin taxes'
  - Some specific goods
  - Environmental externalities (three separate chapters in MRII)
- => 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

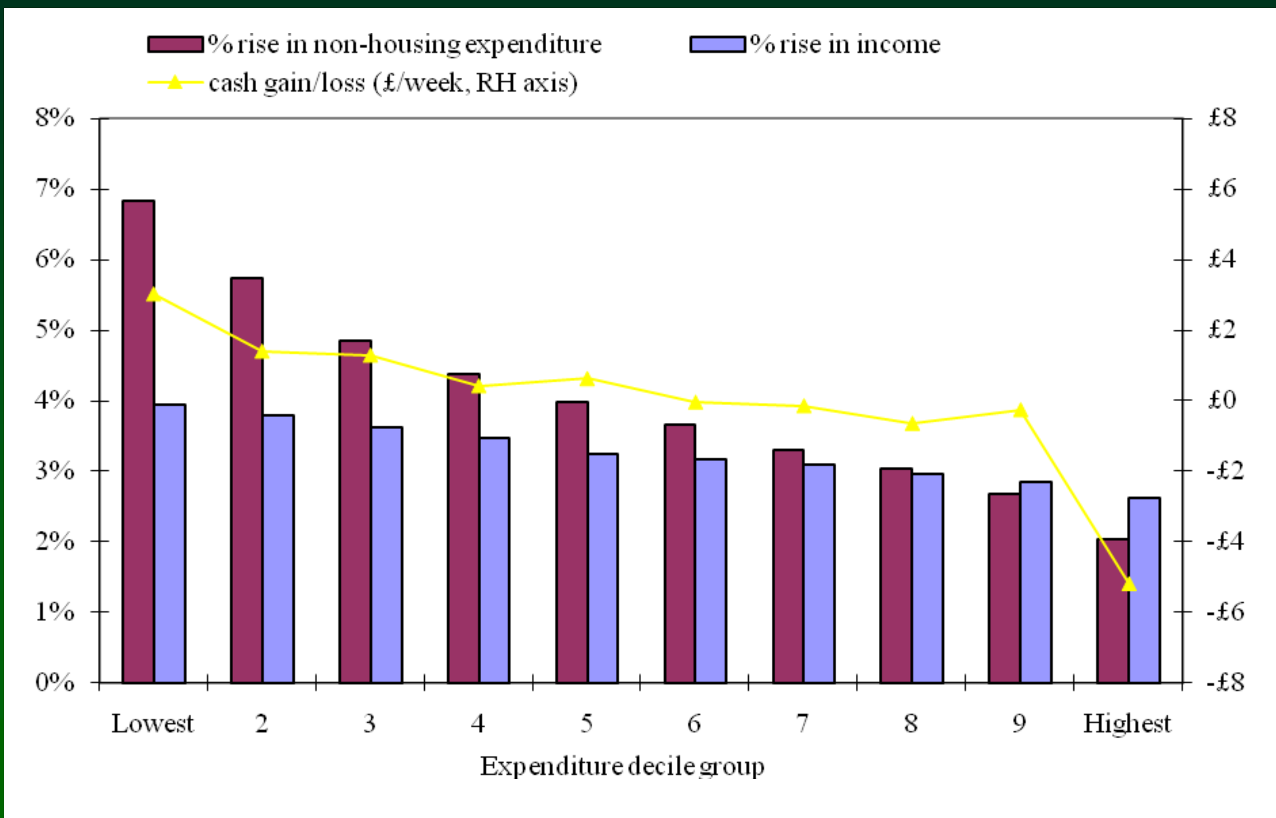
Indirect Taxation – UK case

Zero-rated:	Estimated 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
Cycle helmets	10
Reduced-rated:	
Domestic fuel and power	2,950
Contraceptives	10
Children's car seats	5
Smoking cessation products	10
Residential conversions and renovations	150
VAT-exempt:	
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 percentage share of an additional hour worked

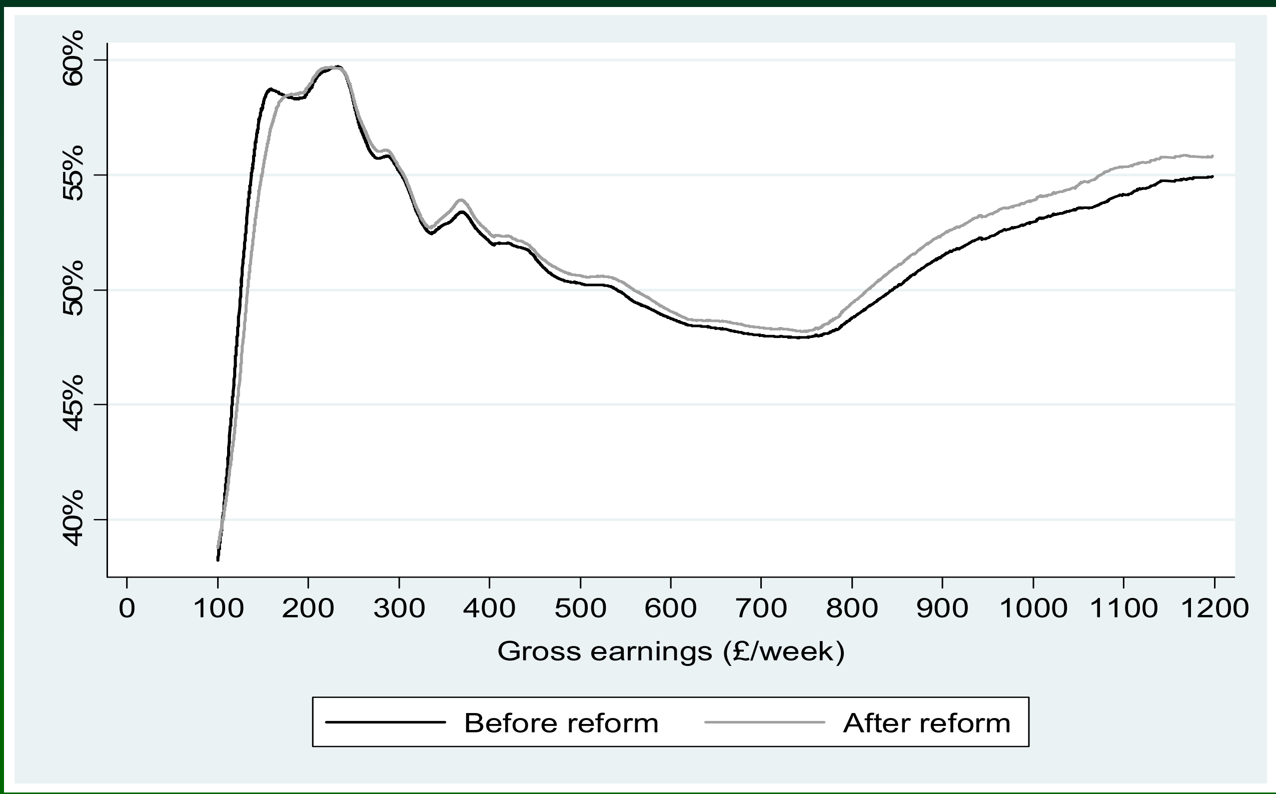
Bread and Cereals	-0.024 (64.3)
Meat and Fish	-0.060 (-49.2)
Dairy products	-0.045 (-66.6)
Tea and coffee	-0.008 (-29.5)
Fruit and vegetables	-0.037 (-52.8)
Other zero-rated foods	-0.020 (-28.1)
Food eaten out	0.054 (38.5)
Beer	0.020 (13.3)
Wine and spirits	0.020 (21.2)
Domestic fuels	-0.049 (-30.6)
Household goods and services	0.064 (24.2)
Adult clothing	0.000 (-0.0)
Childrens' clothing	-0.006 (-8.7)
Petrol and diesel	0.046 (35.9)
Leisure goods	0.019 (9.4)
Leisure services	0.086 (28.1)

Effect of base broadening reform with earnings tax reform compensation, by expenditure decile



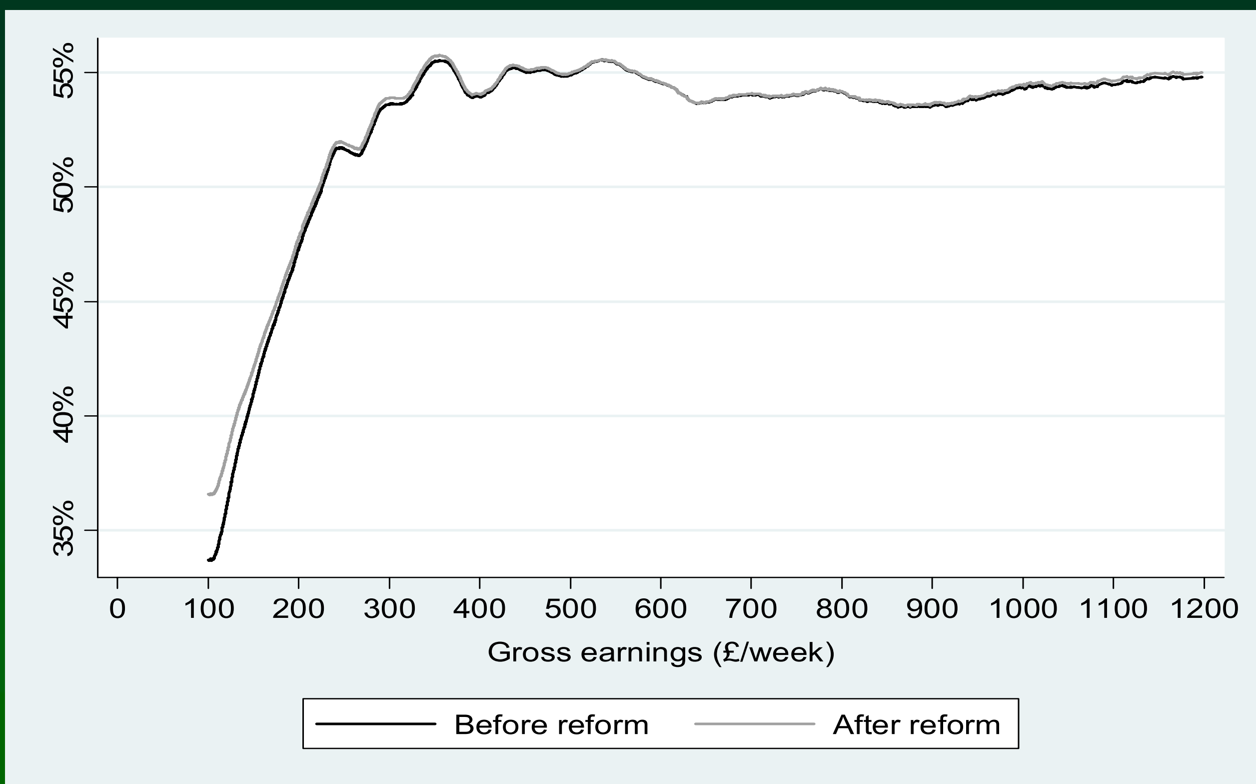
*R*eform revenue neutral and designed to leave effective tax rates on earnings unchanged

EMTR: before and after indirect tax reform



*R*eform revenue neutral and designed to leave effective tax rates on earnings unchanged

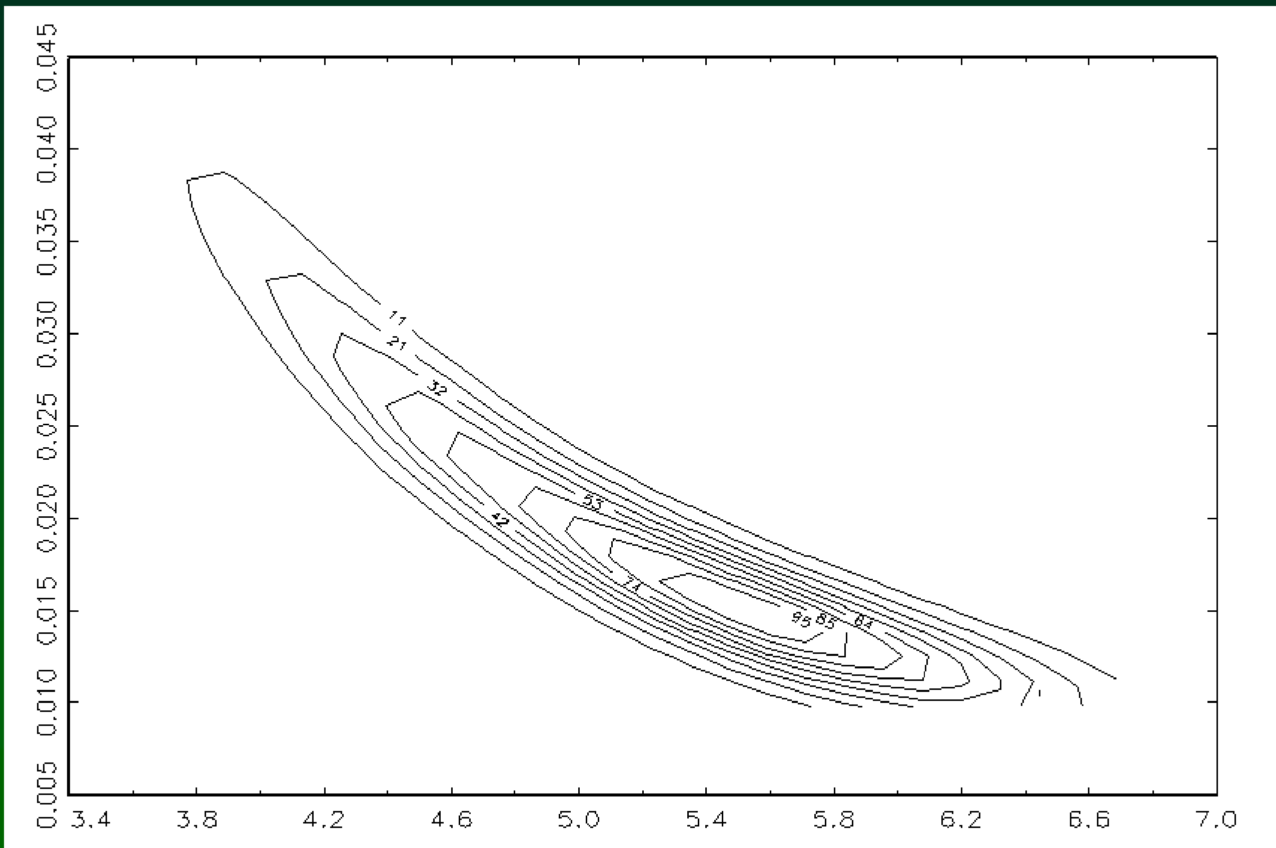
EMTR: before and after indirect tax reform



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 these results is that the 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.
- The overall outcome is that there is little change in work incentives at any earnings level
- Reasonable welfare gains from removing distortions

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



The shape of a reform package

- Broaden VAT base
  - keep sin taxes + sensibly reformed environmental taxes/permits
- Limit tax on the normal return to capital
  - At personal or corporate level
  - But tax other equity/excess returns with usual rate schedule
  - Pensions exceptional/longer term saving – need additional incentive
  - Some age-based taxation
- Consumption tax treatment of housing too; land value tax if feasible
- Lifetime accessions tax
- Reforms to the income tax / benefit rate schedule
  - Apply lessons from empirical evidence on response elasticities
  - Compensate for distributional effects of reforms above

Many key issues unresolved, with little evidence base

Including:

- Human capital investment bias and savings taxation
- Tax credits and earnings progression
- Taxation of financial services
- Transition issues and capitalisation
- ….

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

1. Key margins of adjustment to tax reform
2. Knowledge of effective tax rates
3. The importance of information, complexity and salience
4. Evidence on the size of responses
5. Implications for tax design

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

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