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

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
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: Helmut 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?*
- + commentaries by Moffitt, Laroque and Hoynes

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**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
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)
Female Employment by age – US, FR and UK 1977

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

United-States

1977: 1148 hours
2007: 1308 hours

1977: 1212 hours
2007: 1308 hours

Change in structure
Women 55-74
Men 55-74
Women 30-54
Men 30-54
Women 16-29
Men 16-29

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

Blundell, Bozio and Laroque (2010)

United-Kingdom

1977: 1124 hours
2007: 1094 hours

France

1977: 953 hours
2007: 953 hours

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Thinking about Responses at the Intensive and Extensive Margin

- Write within period utility as
  \[
  U = \begin{cases}
  c - \frac{h^{1+\alpha}}{1+\alpha} - \beta & \text{if } h > 0 \\
  c & \text{if } h = 0
  \end{cases}
  \]

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

- 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
  \[ H_t = \sum_{j=1}^{J} q_{jt} H_{jt} \text{ and } H_{jt} = p_{jt} h_{jt} \]

- 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

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

<table>
<thead>
<tr>
<th></th>
<th>Year</th>
<th>Men 16-29</th>
<th>Women 16-29</th>
<th>Men 30-54</th>
<th>Women 30-54</th>
<th>Men 55-74</th>
<th>Women 55-74</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\Delta$</td>
<td></td>
<td>-82</td>
<td>-38</td>
<td>-82</td>
<td>36</td>
<td>-36</td>
<td>-3</td>
</tr>
<tr>
<td></td>
<td>E-L, E-P</td>
<td>[-35, -29]</td>
<td>[14, 17]</td>
<td>[-25, -22]</td>
<td>[41, 41]</td>
<td>[-23, -20]</td>
<td>[15, 17]</td>
</tr>
<tr>
<td>$\Delta$</td>
<td></td>
<td>-71</td>
<td>-9</td>
<td>-70</td>
<td>39</td>
<td>-42</td>
<td>10</td>
</tr>
<tr>
<td><strong>US</strong></td>
<td>I-P, I-L</td>
<td>[-6, -6]</td>
<td>[1, 1]</td>
<td>[-5, -5]</td>
<td>[14, 19]</td>
<td>[3, 3]</td>
<td>[3, 5]</td>
</tr>
<tr>
<td></td>
<td>E-L, E-P</td>
<td>[-13, -13]</td>
<td>[21, 21]</td>
<td>[-14, -14]</td>
<td>[72, 77]</td>
<td>[3, 3]</td>
<td>[33, 35]</td>
</tr>
<tr>
<td>$\Delta$</td>
<td></td>
<td>-19</td>
<td>22</td>
<td>-19</td>
<td>90</td>
<td>6</td>
<td>38</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Single Mothers</th>
<th>Marginal Effect</th>
<th>Standard Error</th>
<th>Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Resources Survey</td>
<td>4.5</td>
<td>1.55</td>
<td>25,163</td>
</tr>
<tr>
<td>Labour Force Survey</td>
<td>4.7</td>
<td>0.55</td>
<td>233,208</td>
</tr>
</tbody>
</table>

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:

\[ U_p(c, h, P; X, \varepsilon) = \alpha_y(X, \varepsilon) \frac{c^\theta_y(X) - 1}{\theta_y(X)} \]

\[ + \alpha_i(X, \varepsilon) \frac{(1-h/H)^{\theta_i(X)} - 1}{\theta_i(X)} - P \cdot \eta(X, \varepsilon) \]

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

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

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)
- 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

<table>
<thead>
<tr>
<th>Weekly Earnings</th>
<th>Density</th>
<th>Extensive</th>
<th>Intensive</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.4327</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>0.1575</td>
<td>0.280 (.020)</td>
<td>0.085 (.009)</td>
</tr>
<tr>
<td>150</td>
<td>0.1655</td>
<td>0.321 (.009)</td>
<td>0.219 (.025)</td>
</tr>
<tr>
<td>250</td>
<td>0.1298</td>
<td>0.152 (.005)</td>
<td>0.194 (.020)</td>
</tr>
<tr>
<td>350</td>
<td>0.028</td>
<td>0.058 (.003)</td>
<td>0.132 (.010)</td>
</tr>
<tr>
<td>Employment elasticity</td>
<td>0.820 (.042)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Structural Model Elasticities – low education lone parents

(b) Youngest Child Aged 11-18

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

Blundell and Shephard (2010)

(c) Youngest Child Aged 0-4

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

- 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)

<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>y-child 0 to 2</th>
<th>y-child 3 to 4</th>
<th>y-child 5 to 10</th>
<th>y-child 11 to 18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in employment rate:</td>
<td>4.89</td>
<td>0.65</td>
<td>5.53</td>
<td>6.83</td>
<td>4.03</td>
</tr>
<tr>
<td></td>
<td>0.84</td>
<td>0.6</td>
<td>0.99</td>
<td>0.94</td>
<td>0.71</td>
</tr>
<tr>
<td>Average change in hours:</td>
<td>1.02</td>
<td>0.01</td>
<td>1.15</td>
<td>1.41</td>
<td>1.24</td>
</tr>
<tr>
<td></td>
<td>0.23</td>
<td>0.21</td>
<td>0.28</td>
<td>0.28</td>
<td>0.22</td>
</tr>
</tbody>
</table>

- 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:

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

• 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 \(X, \varepsilon\)

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

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

\[
\int \int_{X, \varepsilon} T(wh^*, h^*; X)dF(\varepsilon)dG(X) \geq \overline{T}(= -R)
\]

for a given \(R\).

- We solve for \(T(.)\) with structural estimation and simulation.
Control preference for equality by transformation function:

\[
\gamma(U \mid \theta) = \frac{1}{\theta} \{ (\exp U)^\theta - 1 \}
\]

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

Optimal earnings schedules, youngest child 0–4

Blundell and Shephard (2010)

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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

Blundell and Shephard (2010)
Quantifying Welfare Gains from Hours Rules

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

<table>
<thead>
<tr>
<th></th>
<th>19 hours</th>
<th>optimal hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\theta = -0.4$</td>
<td>0.9%</td>
<td>2.2%</td>
</tr>
<tr>
<td>$\theta = -0.2$</td>
<td>0.8%</td>
<td>2.5%</td>
</tr>
<tr>
<td>$\theta = 0.0$</td>
<td>0.2%</td>
<td>1.8%</td>
</tr>
</tbody>
</table>

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

![Graph showing hourly wages by months after random assignment.](image)
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
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)

\[ t = \frac{1}{1 + a \cdot e} \]

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
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

<table>
<thead>
<tr>
<th>Year Difference</th>
<th>Simple Difference</th>
<th>DD Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>1978 vs 1981</td>
<td>0.32</td>
<td>0.08</td>
</tr>
<tr>
<td>1986 vs 1989</td>
<td>0.38</td>
<td>0.41</td>
</tr>
<tr>
<td>1978 vs 1962</td>
<td>0.63</td>
<td>0.86</td>
</tr>
<tr>
<td>2003 vs 1978</td>
<td>0.89</td>
<td>0.64</td>
</tr>
<tr>
<td>Full time series</td>
<td>0.69</td>
<td>0.46</td>
</tr>
</tbody>
</table>

(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)
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

Source: UK FES 1974-2006
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

<table>
<thead>
<tr>
<th>Zero-rated:</th>
<th>Estimated cost (£m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td>11,300</td>
</tr>
<tr>
<td>Construction of new dwellings</td>
<td>8,200</td>
</tr>
<tr>
<td>Domestic passenger transport</td>
<td>2,500</td>
</tr>
<tr>
<td>International passenger transport</td>
<td>150</td>
</tr>
<tr>
<td>Books, newspapers and magazines</td>
<td>1,700</td>
</tr>
<tr>
<td>Children’s clothing</td>
<td>1,350</td>
</tr>
<tr>
<td>Drugs and medicines on prescription</td>
<td>1,350</td>
</tr>
<tr>
<td>Vehicles and other supplies to people with disabilities</td>
<td>350</td>
</tr>
<tr>
<td>Cycle helmets</td>
<td>10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reduced-rated:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic fuel and power</td>
<td>2,950</td>
</tr>
<tr>
<td>Contraceptives</td>
<td>10</td>
</tr>
<tr>
<td>Children’s car seats</td>
<td>5</td>
</tr>
<tr>
<td>Smoking cessation products</td>
<td>10</td>
</tr>
<tr>
<td>Residential conversions and renovations</td>
<td>150</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VAT-exempt:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rent on domestic dwellings</td>
<td>3,500</td>
</tr>
<tr>
<td>Rent on commercial properties</td>
<td>200</td>
</tr>
<tr>
<td>Private education</td>
<td>300</td>
</tr>
<tr>
<td>Health services</td>
<td>900</td>
</tr>
<tr>
<td>Postal services</td>
<td>200</td>
</tr>
<tr>
<td>Burial and cremation</td>
<td>100</td>
</tr>
<tr>
<td>Finance and insurance</td>
<td>4,500</td>
</tr>
</tbody>
</table>

### Impact on budget share of labour supply - conditional on income and prices

<table>
<thead>
<tr>
<th>Item</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bread and Cereals</td>
<td>Negative</td>
</tr>
<tr>
<td>Meat and Fish</td>
<td>Negative</td>
</tr>
<tr>
<td>Dairy products</td>
<td>Negative</td>
</tr>
<tr>
<td>Tea and coffee</td>
<td>Negative</td>
</tr>
<tr>
<td>Fruit and vegetables</td>
<td>Negative</td>
</tr>
<tr>
<td>Food eaten out</td>
<td>Positive</td>
</tr>
<tr>
<td>Beer</td>
<td>Positive</td>
</tr>
<tr>
<td>Wine and spirits</td>
<td>Positive</td>
</tr>
<tr>
<td>Domestic fuels</td>
<td>Negative</td>
</tr>
<tr>
<td>Household goods and services</td>
<td>Positive</td>
</tr>
<tr>
<td>Adult clothing</td>
<td>Positive</td>
</tr>
<tr>
<td>Childrens’ clothing</td>
<td>Negative</td>
</tr>
<tr>
<td>Petrol and diesel</td>
<td>Positive</td>
</tr>
</tbody>
</table>

Source: QUAIDS on UK FES, MR¹
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: incentive to work at all
Participation tax rates

VAT reform: incentive to increase earnings
Effective marginal tax rates
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: MIRI
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

<table>
<thead>
<tr>
<th>Decile of gross financial wealth</th>
<th>Range of gross financial wealth (£'000s)</th>
<th>Proportion of wealth held in:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Private pensions</td>
</tr>
<tr>
<td>Poorest</td>
<td>&lt;1.7</td>
<td>0.126</td>
</tr>
<tr>
<td>2</td>
<td>1.7–16.6</td>
<td>0.548</td>
</tr>
<tr>
<td>3</td>
<td>16.6–39.1</td>
<td>0.652</td>
</tr>
<tr>
<td>4</td>
<td>39.1–75.9</td>
<td>0.682</td>
</tr>
<tr>
<td>5</td>
<td>75.9–122.3</td>
<td>0.697</td>
</tr>
<tr>
<td>6</td>
<td>122.3–177.2</td>
<td>0.747</td>
</tr>
<tr>
<td>7</td>
<td>177.2–245.4</td>
<td>0.781</td>
</tr>
<tr>
<td>8</td>
<td>245.4–350.3</td>
<td>0.818</td>
</tr>
<tr>
<td>9</td>
<td>350.3–511.2</td>
<td>0.790</td>
</tr>
<tr>
<td>Richest</td>
<td>&gt;511.2</td>
<td>0.684</td>
</tr>
<tr>
<td>All</td>
<td></td>
<td>0.736</td>
</tr>
</tbody>
</table>

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 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 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 baring 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

(Some) Additional References (see also Dimensions of Tax Design and Tax by Design)


