

A lifetime perspective on the distributional and incentive effects of UK personal taxes

Mike Brewer, Monica Costa Dias and Jonathan Shaw

Background

- Tax/benefit reform often driven by
 - Redistributive purposes
 - Desire to encourage certain behaviours labour supply, education
- Heterogeneous and complex responses
 - Depend on how economic incentives are affected
 - Overall tax policy environment
 - Individual idiosyncratic circumstances that vary over the course of life
 - and how incentives influence behaviour
 - Present and future costs and gains
 - (Market conditions)
- To understand the effects of tax reform need to consider
 - heterogeneous incentives in a complex net of taxes and benefits
 - heterogeneous responses to incentives
 - litetime consequences of such responses



Background

Two related branches of the literature

- 1. Studies assessing the impact of personal taxes allowing for heterogeneous effects and behavioural responses
 - Effect of work-contingent benefits on labour supply of parents (Brewer et al., 2006, Francesconi and van der Klaauw (2007) and others)
 - Optimal taxation of low income families with children (Blundell and Shephard, 2009)
 - Static framework: individuals disregard future consequences of their actions
 - Yet, many individual decisions are dynamic in nature
 - Education and human capital formation, labour supply, marriage and child bearing
 - Large changes in incentives may have life-cycle effects
 - Progressive taxation and the value of education and human capital
 - Work-contingent subsidies: human capital formation and job-attachment
 - Insurance value of taxation and insurance value of human capital
 - Often dependence of results on tax environment not clearly established



Background

- 2. Studies of the lifecycle and cross-sectional distribution of income and tax burden
 - Progressivity of tax system from life-cycle and cross section perspectives (Bengtsson and others, 2011, Piketty and Saez, 2007)
 - Distribution of top incomes (Atkinson, 2005, Dell, 2006)
 - Focus on how the tax system changes the income distribution
 - Consider all sources of income and pay, with particular attention to top incomes
 - But no attempt to understand how taxation changes incentives and affects behaviour



This project

- Aims to bring together the two branches of the literature
 - To characterise the transfer system from a lifetime perspective
 - Who pays and at what stage of the lifecycle
 - Implied redistribution
 - Insurance role
 - While understanding how the transfer system shapes working and education incentives
 - How incentives change over time
 - And the induced behavioural responses and dynamic lifecycle consequences
 - Which partly explain the observed lifetime patterns in public transfers
- Study UK personal tax system
 - Focus on earned income
 - Using a detailed description of personal taxes and subsidies
 - Analysis relevant for the bottom 95% of the income distribution
 - But disregard retirement pensions



Some questions

- 1. How do financial work incentives change over lifecycle?
 - Build on previous "snapshot" studies of METR and PTR
 - Describe distributions of METR and PTR by age and other factors
 - Cross-section versus lifetime incentives
- 2. How do financial work incentives vary over the income distribution?
 - Annual versus lifetime income
 - Relation to tax progressivity
 - Changes over time
- 3. How is tax burden distributed over the lifecycle and population?
 - Lifecycle tax burden and its distribution across life periods
 - Distribution of lifecycle tax burden over population and relation to history of family composition, education and initial family background
 - Implied level of lifecycle redistribution of current UK tax system



Framework

- Structural dynamic model of education, labour supply and savings
 - Coupled with detailed description of personal tax system
 - Allowing for study of current system, consequences of recent changes and counterfactual analysis of hypothetical reforms
- Focus on women, for whom behavioural responses are more important
 - Role of family composition
 - Importance of childcare costs
- Life in three stages
 - 1. Education (up to 18/21)
 - Secondary, A-levels or university (determines type of human capital)
 - 2. Working life (18/21-59)
 - Labour supply {0, PT, FT} and consumption
 - Marriage and childbearing
 - 3. Retirement (60-69)
 - Deterministic at age 60

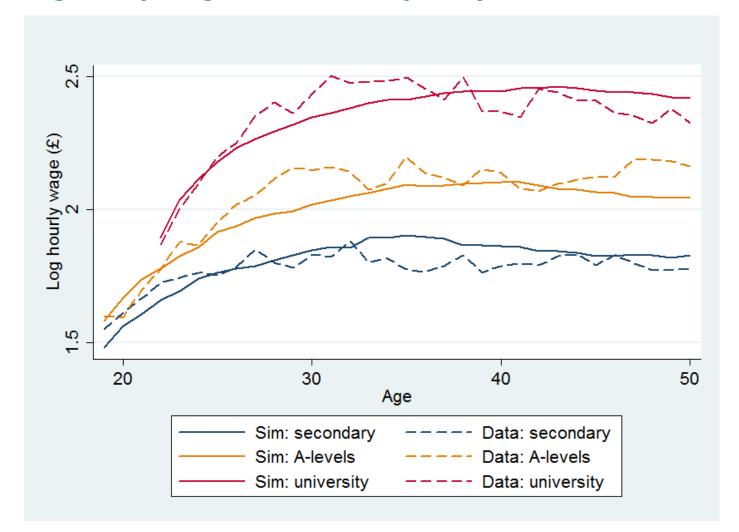


Framework (2)

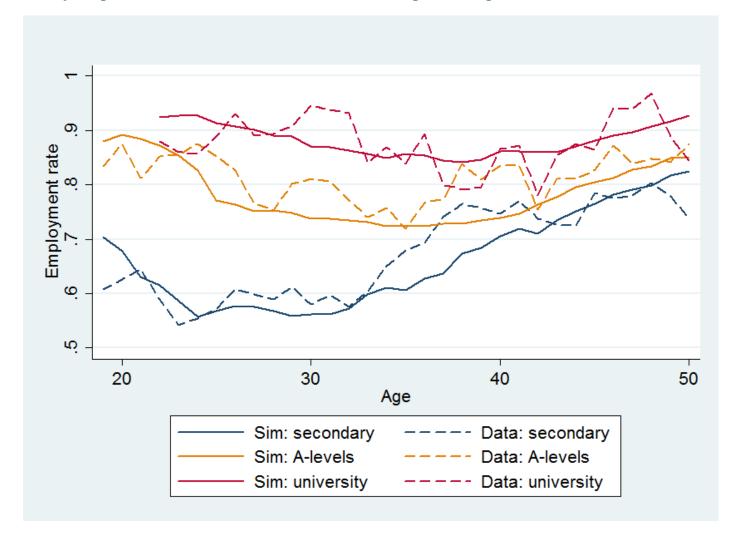
- Heterogeneous individuals
 - Start of life: preferences for work/study, ability, initial wealth
 - During life: family formation, productivity (health)
- Uncertainty faced by individuals
 - Own productivity (health)
 - Family dynamics: partnering/separation, child bearing
 - Partner employment and income
 - Personal insurance mechanisms include human capital and savings
- Individual decisions conditioned by market failures: insurance and credit markets
- Role for policy
 - Redistribution: ex-ante inequality and permanent productivity shocks
 - Mutualising risk by facilitating life-cycle transfers
 - transitory income shocks in the presence of market failures



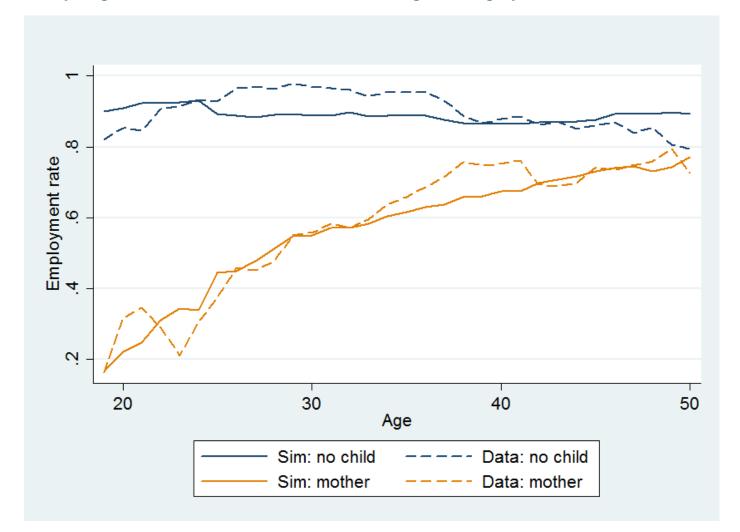
Model fit (1) Log hourly wage over the lifecycle by education level



Model fit (2) Employment rate over the lifecycle by education level



Model fit (3) Employment rate over the lifecycle by presence of child



Model fit (4) Impact of WFTC reform on employment

Combined effect of WFTC and other reforms between 1999 and 2002

	Our model	BBS (2005)	FRK (2009)	BDSS (2006)
Lone mothers	+4.4%	+3.6%		+3.7%
Women in couples				
All	-2.0%		+0.7%	-0.4%
Partner working	-3.0%	-0.1%	+0.1 to +0.6%	
Partner not working	+4.1%	+2.6%	+3.1%	

BBS (2005) = Blundell, Brewer and Shephard (2005); reduced form estimate

FRK (2009) = Francesconi, rainer and van der Klaauw (2009); reduced form estimate

BDSS (2006) = Brewer, Duncan, Shephard and Suarez (2006); static structural estimate



METR and PTR

- Definition: proportion of the change in gross family earnings from changing hours of work lost to increased taxes and reduced benefits
- Difference between METR and PTR is size of hours change

$$METR/PTR = 1 - \frac{Y_1 - Y_0}{E_1 - E_0}$$

$$E_1 = \text{incremented gross family earnings}$$

$$Y_0 = \text{net family earnings}$$

 $E_0 = \text{gross family earnings}$

 Y_1 = incremented net family earnings

- We treat childcare in two ways:
 - "No childcare costs"
 - "Varying childcare costs" treated like a tax
- METR based on working one extra hour



ATR including subsidies

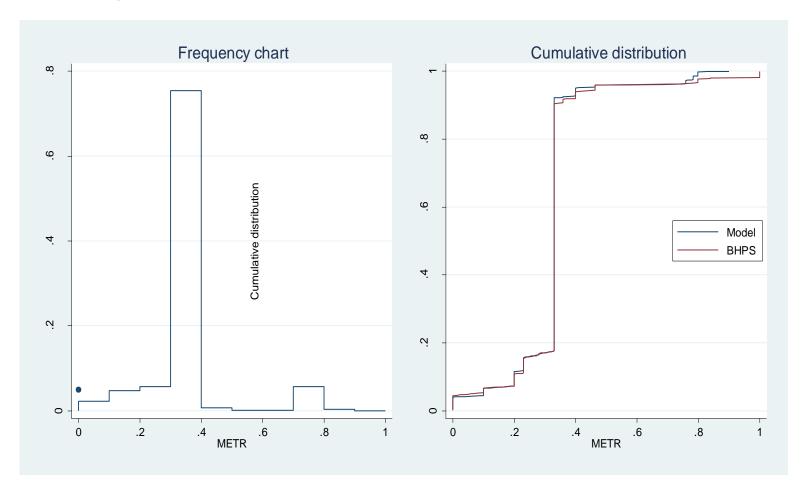
- Definition: tax burden as a proportion of gross family earnings
- Tax burden is net of subsidies
- Excludes foregone subsidies while unemployed

$$ATR = \frac{T}{E}$$
 $T = \text{family tax burden net of subsidies}$ $E = \text{gross family earnings}$

- We treat childcare in two ways:
 - "No childcare costs"
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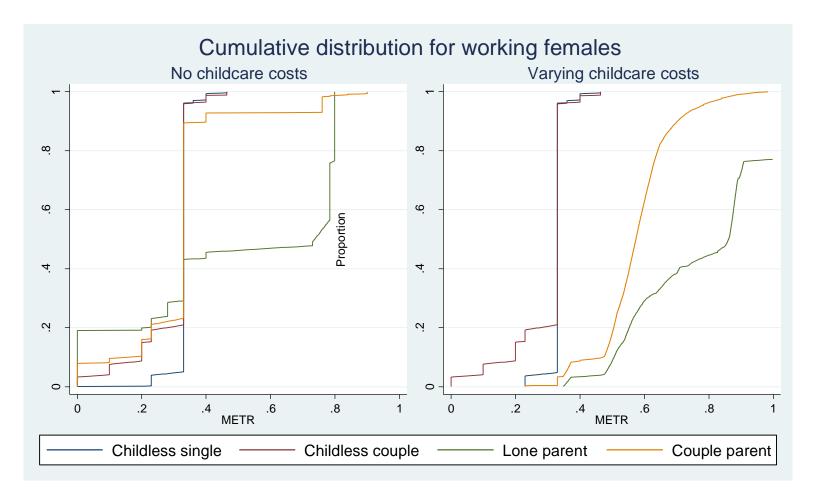


METR for working females (no childcare costs) Model versus BHPS data 1999 tax system



METR by family type

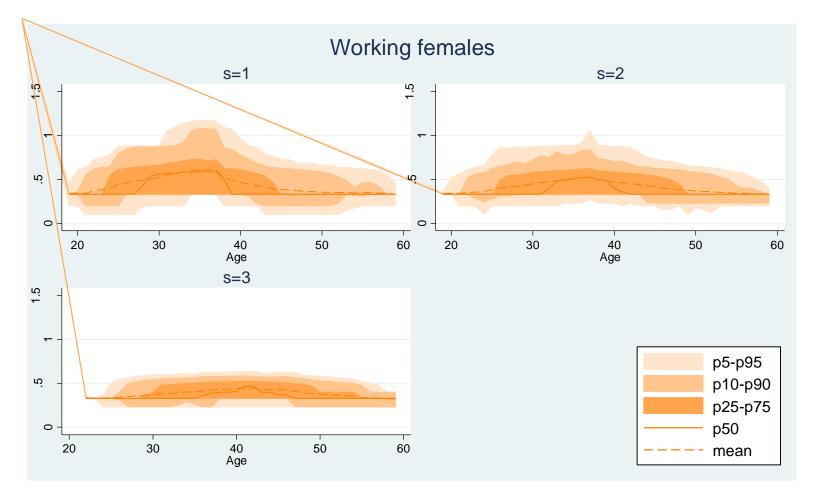
1999 tax system





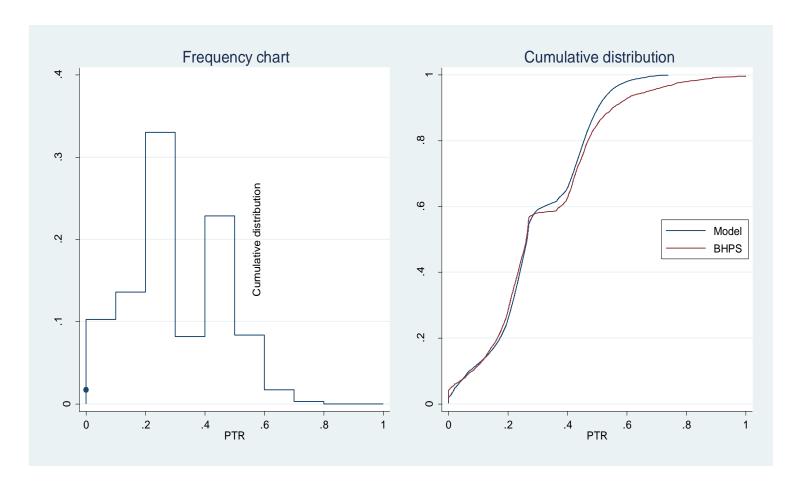
METR by age and education

Varying childcare, 1999 tax system



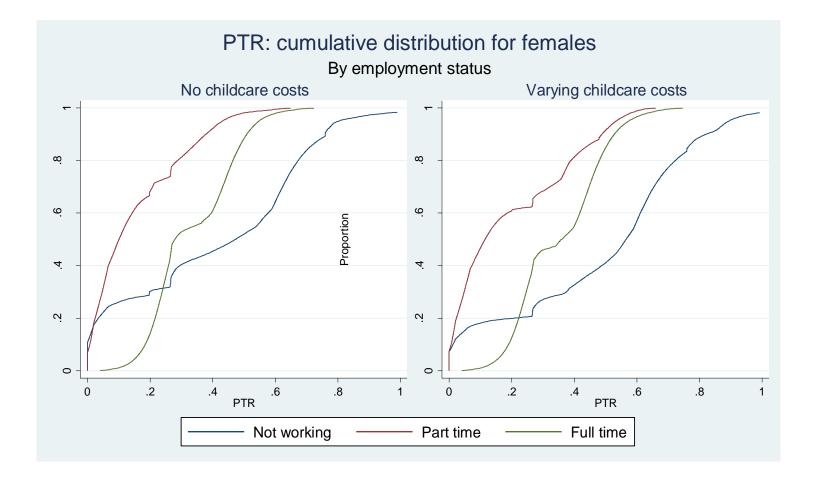


PTR for working females (no childcare costs) Model versus BHPS data 1999 tax system



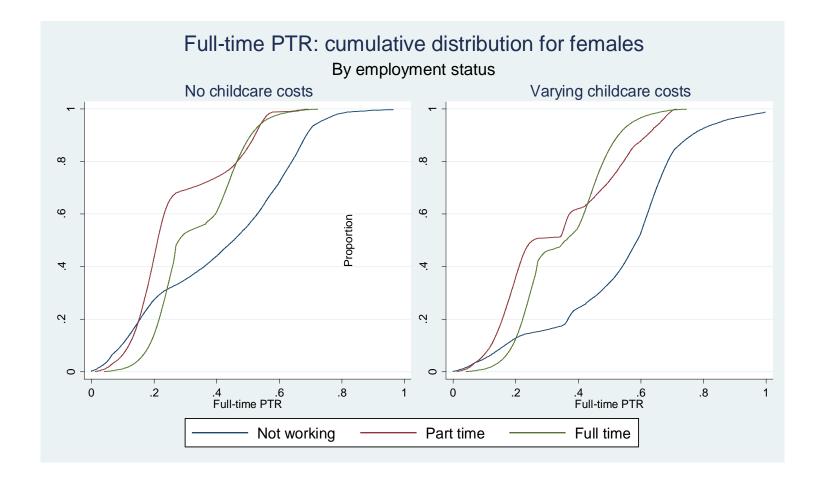
PTR by employment status

All females, 1999 tax system





PTR by employment status: full-time work All females, 1999 tax system





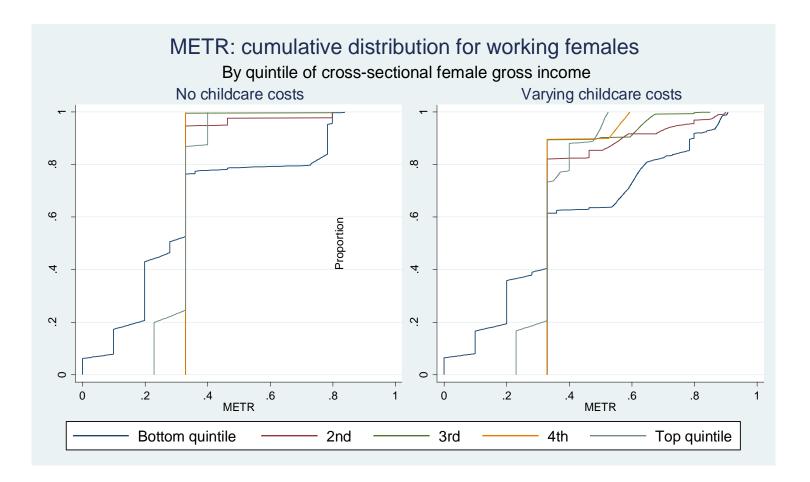
Working incentives 1999 tax system

- Over 70% of working females face same METR
- Mothers, especially lone mothers, face largest disincentives at the intensive margin
- Disincentives are stronger for low-skilled workers, who are more likely to be on taper regions for Family Credit
- We predict women respond to incentives at the extensive and intensive margins:
 - Unemployed women face higher PTR
 - Women in part-time work face especially low PTRs for PT work



METR by annual earnings

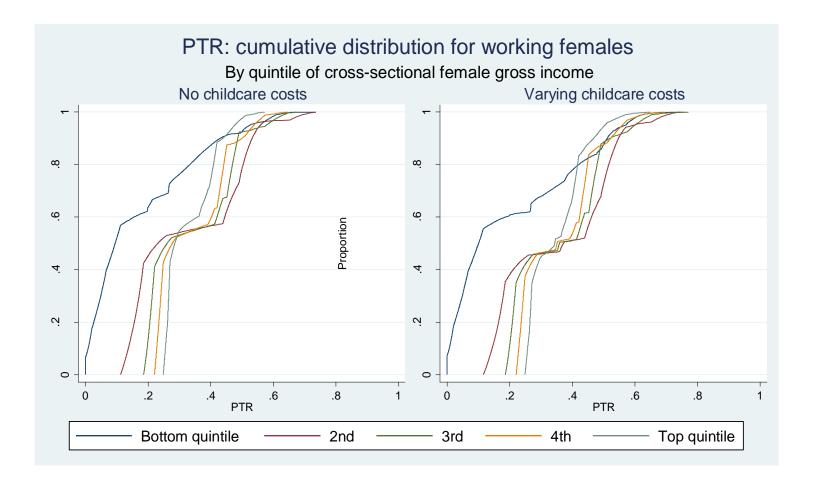
Working females, 1999 tax system





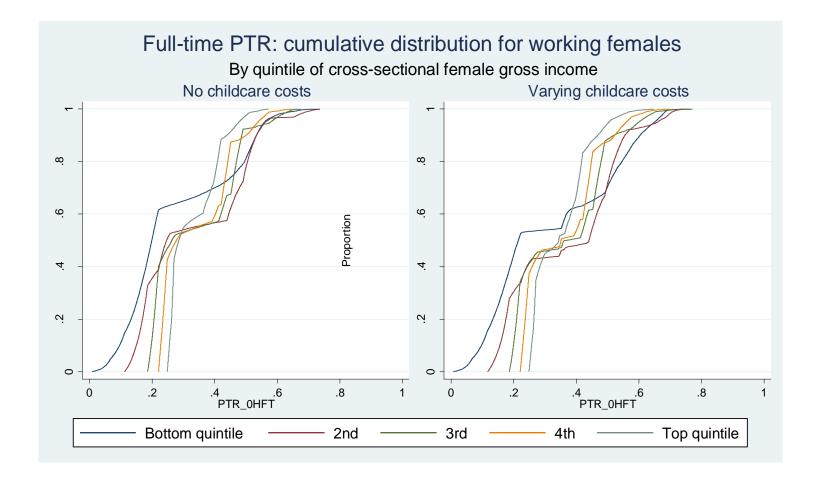
PTR by annual earnings

Working females, 1999 tax system





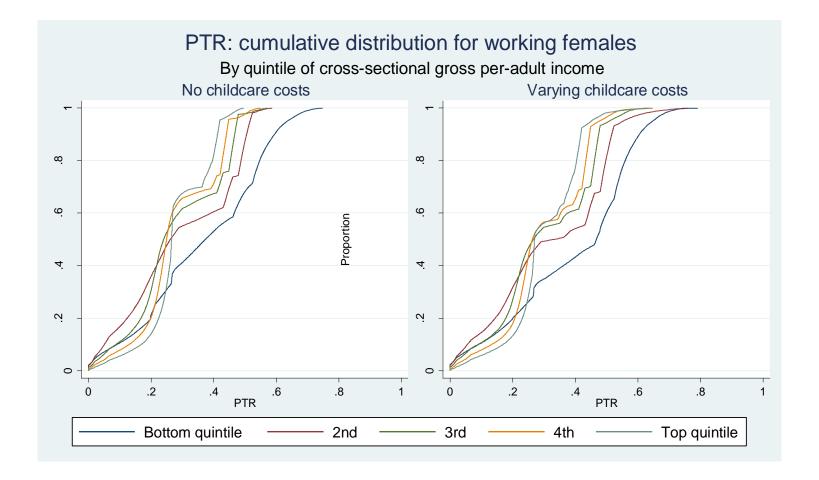
PTR by annual earnings: full-time work Working females, 1999 tax system





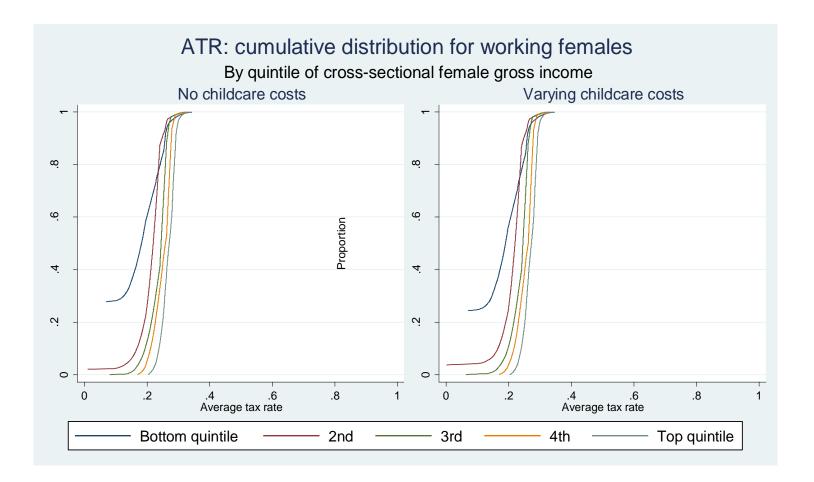
PTR by annual family earnings

Working females, 1999 tax system



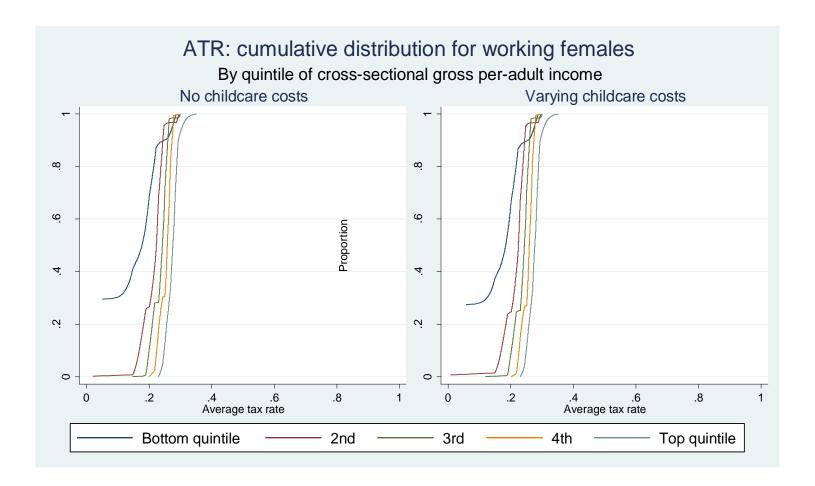


ATR (including subsidies) by annual earnings Working females, 1999 tax system





ATR (including subsidies) by annual family earnings Working females, 1999 tax system





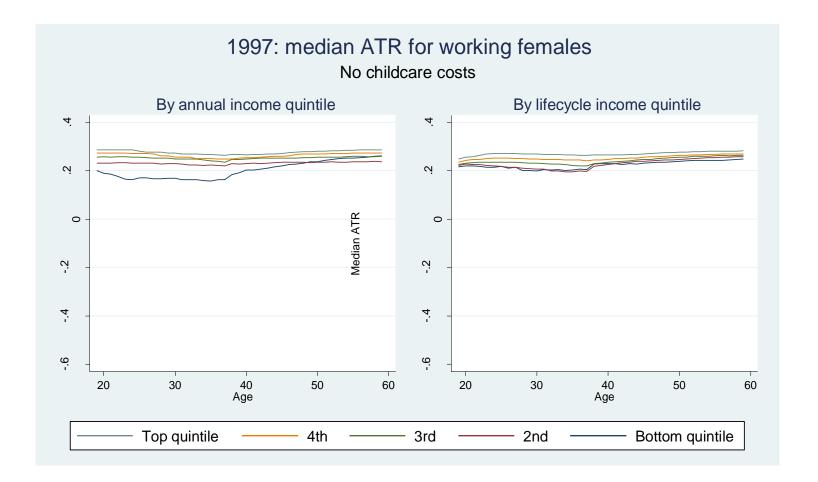
Work incentives and progressivity 1999 tax system

- High taxes at the intensive labour supply margin affect disproportionately the bottom of the earnings distribution
 - Likely to be exposed to benefit and tax credit withdrawal
- At the extensive margin, the women on lower earnings face lower PTRs
 - But partly due to choice of lower hours of work
- However, when considering family income quintiles, high PTRs affect the lowest quintile more
- But the tax system looks mildly progressive from an annual perspective, with ATRs increasing with income among working women
- Although ATRs much more homogeneous than METR or PTRs



ATR (including subsidies) by age

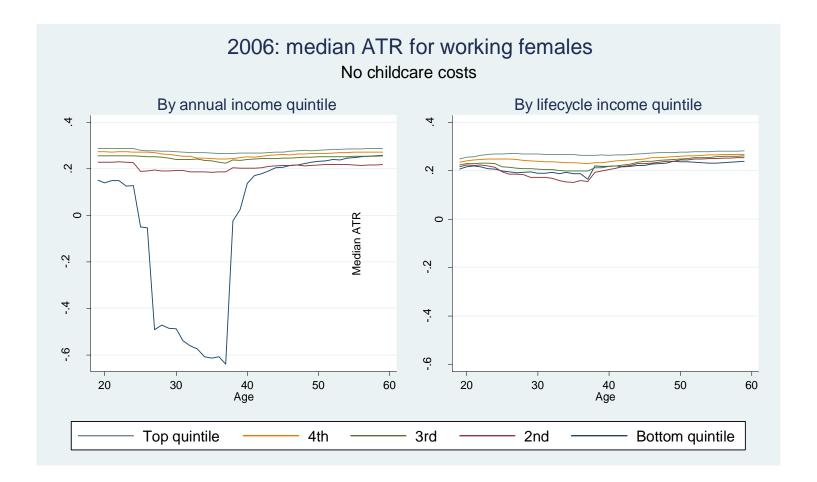
Annual vs lifetime income, 1997 tax system





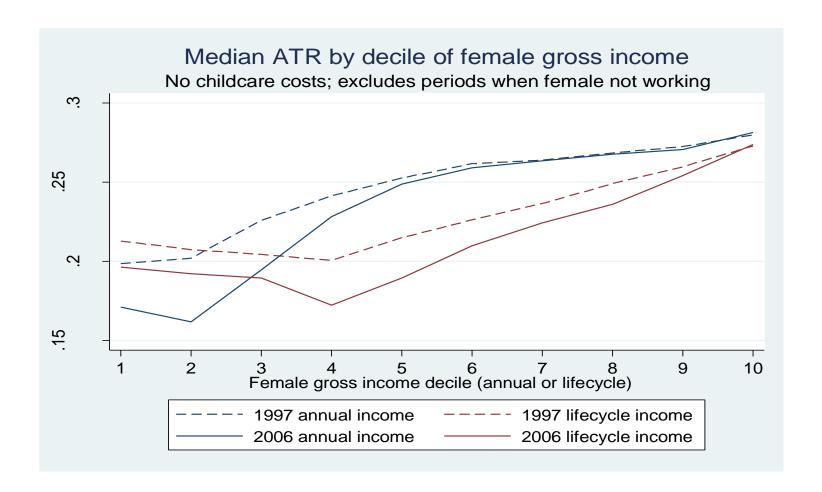
ATR (including subsidies) by age

Annual vs lifetime income, 2006 tax system





ATR (including subsidies) by income decile 2006 versus 1997 tax systems





Lifetime versus annual tax progressivity 1997 versus 2006 tax systems

- Among workers, the personal tax system is more progressive from an annual perspective
- And became much more so in the early 2000s with the increasing generosity of tax credits targeted at families
- Major differences at the bottom quintile during childbearing years
 - Mobility across income deciles during lifetime
 - Large subsidies towards families with children affect women with very different earnings ability
 - The effective ATRs of the bottom 3 lifetime income quintiles look almost identical
- But this analysis excludes women out of work



Concluding remarks

- Strong heterogeneity in working incentives, even when restricting attention to working women
- While working women on low earnings face lower PTRs, this is in part a consequence of their choice of lower hours
 - Mothers are heavily represented in this group
 - But working women in low income families face high PTRs with the withdrawal of (unemployment) benefits
- Among working women, the transfer system seems to be mildly progressive
 - Became more so in the early 2000s
 - While increasing trasnfers accross lifecycle periods
 - And creating strong incentives to move across income levels to benefit from generous benefits during childbaring years

