



Centre for Market and
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Does welfare reform affect fertility?

Evidence from the UK

Mike Brewer (Institute for Fiscal Studies)

Anita Ratcliffe (CMPO, University of Bristol)

Sarah Smith (CMPO and IFS)



University of
BRISTOL

The Leverhulme Trust

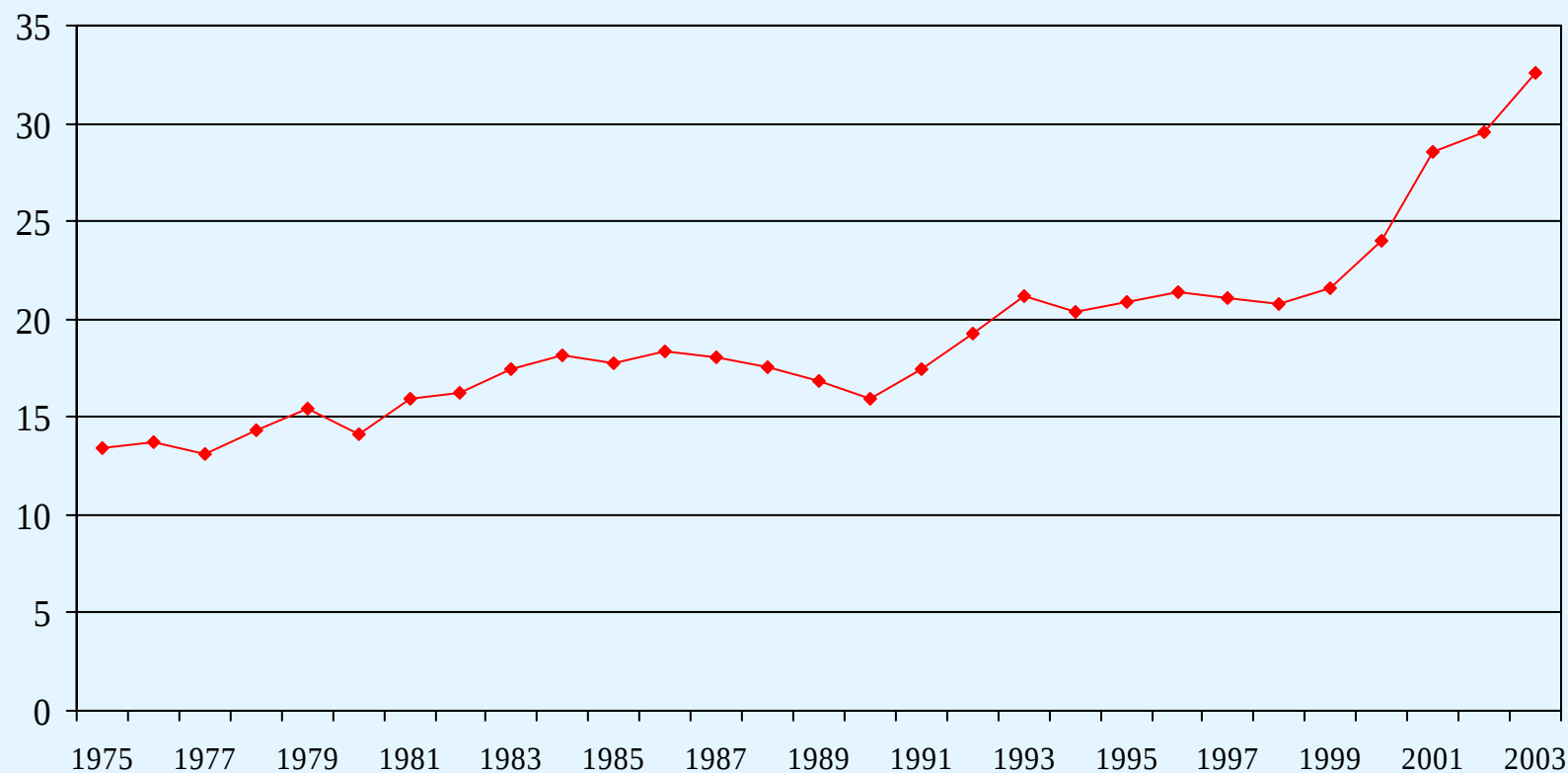
The impact of welfare reform on fertility

- UK government substantially increased financial help for (low-income) families in the UK from 1998 to 2002 (and beyond)
 - Working Families Tax Credit (WFTC) replaced Family Credit (FC) from October 1999
 - Generosity of means-tested benefits for non-working families increased
 - Small rise in child benefit
 - Government spending per child rose by 50% (in real terms) between 1999 – 2003
- The primary aim of reform to “make work pay” and to tackle child poverty, but did the reforms also affect fertility and family formation?
 - Assumption behind many analyses of policies on employment is that fertility (and partnership) are unaffected
 - Insights into likely impact of pro-natalist financial incentives on fertility
- What we do:
- Natural experiment approach
 - Compare fertility “before” and “after” the reform for women affected by the reform: the “treatment” group (low education/ low income)
 - Contrast with change over the same time period for women not affected by the reform: the “control” group (high education/ high income)
- The evidence suggests that the reforms were associated with an increase in first births among couples, but no effect on higher order births

Related literature

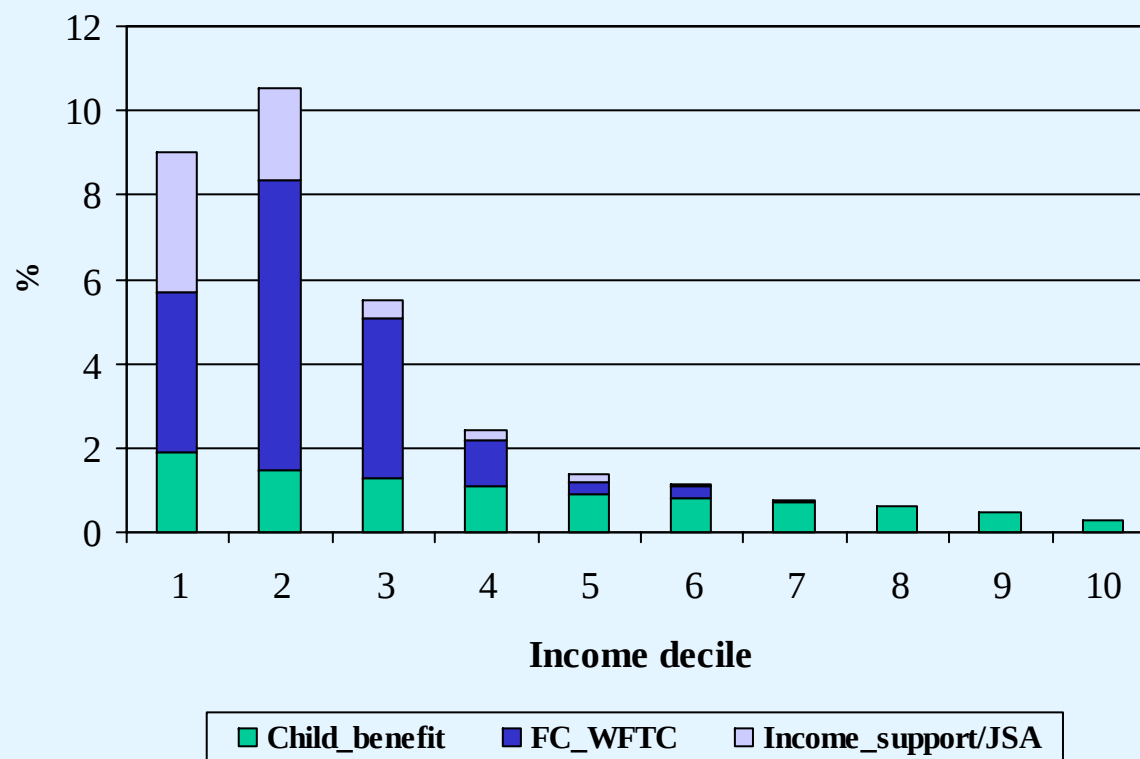
- Compared to the US, very few UK studies of impact of welfare reform on fertility and family formation
- Extensive US literature looking at effect of welfare (mostly AFDC) on partnership and fertility (summarized Moffitt, 1997)
 - Main focus is on lone parents, most studies exploit state/ time variation, majority find a positive effect of more generous benefits on fertility (and negative effect on marriage), but results are sensitive to methodology
- Baugham and Dickert-Conlin (2006)
 - Exploited variation in state EITC, Overall, negative effect of EITC on fertility, but married and unmarried women respond differently
- Francesconi and van der Klauuw (2007)
 - Negative (insignificant) effect of WFTC on subsequent births among lone parents
- Whittington (1992), Whittington et al (1990)
 - Time-series variation in US dependent tax exemption: Small, positive (significant) effect
- Ermisch (1988)
 - (Limited) time-series variation in UK child benefit rates: small, positive (significant) effect for third and higher births
- Milligan (2005)
 - Allowance for Newborn Children (ANC), paid \$Can500 for 1st birth, \$Can1,000 for second and \$Can8,000 for third births, introduced Quebec 1994
 - Estimates from differences-in-differences approach show large, sig effects. First births increased by 12%, second and higher order births by 25%
 - \$Can1,000 increase in first year estimated to increase probability of having a child by 16.9%; bigger for higher income families.

Mean spending on child-contingent cash transfers/tax credits/allowances (£ per week per child, 2003 prices)



Source: Adam and Brewer, 2004

Change in entitlement to child-contingent benefits as % disposable income, 1998/9 – 2002/3 Couples, one child



Based on FRS data and estimated entitlements from TAXBEN

Impact on fertility

- Following Becker (1960), “economic” model of fertility

$$N^* = F(\pi_c, \pi_o, I, \theta)$$

$$\pi_{ci} = x_i + oc_i + cc_i - b_i$$

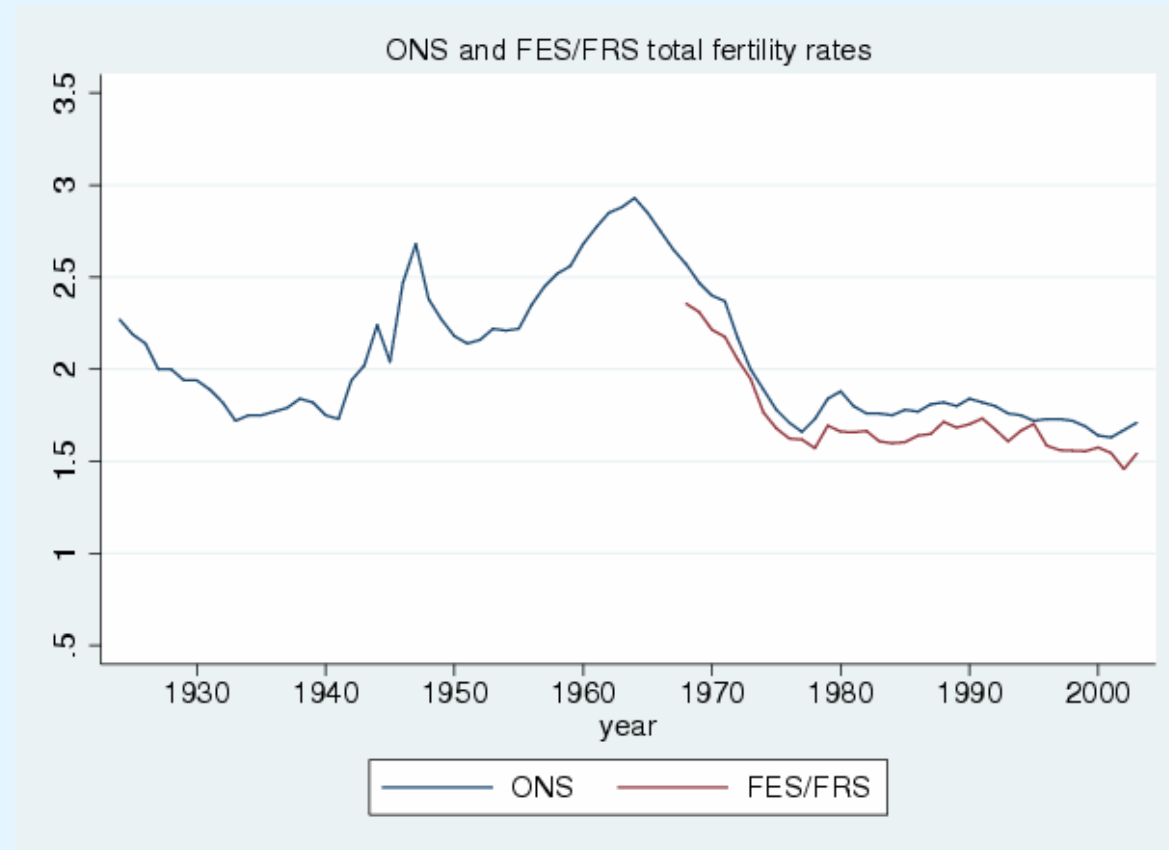
Effect of reforms on income-eligible women:

- income effect will increase demand for quantity OR quality of children
- reduction in household income volatility, increasing fertility (Fraser (2001))
- higher benefits lowers the own price of an additional child (increase fertility)
- Employment effect: if gain to work rises (falls), then opportunity cost rises (falls) and fertility falls (rises)
 - Women in couples, partner not working: WFTC encourages work of 16+ hours
 - Women in couples, partner working: WFTC discourages work
 - Blundell et al (2000), Blundell et al (2005), Brewer et al (2006) – find no/ negative effect of WFTC on employment of women in couples
 - Lone parents: WFTC encourages work of 16+ hours
- Focus on (cohabiting and married) couples because
 - expected impact on fertility unambiguous
 - Most parents in UK have children while cohabiting couples

Data

- Family Resources Survey, 1995/6 – 2003/4
- Large sample, information on education, income and other socio-demographic characteristics
- Derive the probability that a woman (aged 20-37) had a birth in the previous 12 months
 - **Step 1:** Allocate children in household to natural mothers
 - **Step 2:** Assign randomly-generated date of birth to children (based on their age) if none available.
 - **Step 3:** Infer probability that a woman had a birth in previous 12 months based on date of interview and date of birth of child
- Use information on number and ages of children to derive (approximate) fertility histories

Comparison of estimated TFR with official measure



Annual total fertility rate = number of children a woman would have if she had the age-specific birth rates in that year

Empirical strategy: Diffs-in-diffs

- What we would like to measure – the treatment effect

$$E(N_1 - N_1' \mid T = 1) = E(N_1 \mid T = 1) - E(N_1' \mid T = 1)$$

- What we actually measure:

$$[E(N_1 \mid T = 1) - E(N_0 \mid T = 1)] - [E(N_1 \mid T = 0) - E(N_0 \mid T = 0)]$$

- Treatment group ($T = 1$) = affected by the reform
- Control group ($T = 0$) = not affected by the reform
- Measure birth probabilities, not total number of children (can't separate timing from quantity effects), but also look at “age at first birth”



Choice of treatment/ control groups

- Current income
 - Correlated with reform impact
 - Related to employment and fertility choices; affected by the reform
 - May be subject to transitory shocks
- Education (woman and partner)
 - Exogenous to reform
 - Less strongly correlated with reform
- Education and income
 - Likely to have permanently low incomes



Entitlement to child-contingent benefits, all couples with children

	Education		Earnings		Earnings & education	
	Control	Treatment	Control	Treatment	Control	Treatment
Proportion entitled to FC/WFTC or IS/JSA						
Before	.10	.24	.13	.35	.00	.44
After	.14	.40	.18	.59	.01	.73
Mean weekly entitlement FC/WFTC + IS/JSA + child benefit						
Before	£29.71	£39.00	£32.38	£47.49	£20.92	£54.06
After	£37.270	£56.76	£41.02	£72.02	£24.70	£83.80
Difference	£7.56 (25%)	£17.76 (46%)	£8.64 (27%)	£24.53 (52%)	£3.78 (18%)	£29.74 (55%)



Identification

- Identification of the effect of the reform relies on successfully controlling for everything else that might affect fertility in the treatment group
- Rich set of demographic controls
 - Age, education, kids in household and age of kids in household, and interactions; region, housing tenure, ethnicity
 - Wages for treatment and control groups
- Control group intended to capture other (unobservable) time-varying characteristics, but control group has different fertility, and possibly different fertility trends
 - Control explicitly for differential trends
- Other Reforms
 - More generous maternity leave and pay
 - Promotion of flexible working (legal rights to ask for flexible working not enshrined until 2002)
 - Wider provision of childcare and early years education

Births and number of children

	Education		Earnings		Earnings & education	
	Control	Treatment	Control	Treatment	Control	Treatment
Birth						
Before	.14	.12	.10	.16	.12	.15
After	.13	.11	.09	.16	.10	.15
Num. kids						
Before	0.78	1.55	0.91	1.64	0.78	1.85
After	0.70	1.58	0.89	1.57	0.72	1.87



Probit regression results, average marginal effects Women aged 20-37 in couples

Dependent variable = birth in last 12 months

		Education – couple		Income – couple		Inc/ed – couple	
No announcement effects							
	Treated	.0181 (.0134)	.0315* (.0168)	.0206* (.0119)	.0245* (.0151)	.0312* (.0179)	.0357 (.0257)
	T_kids		-.0153 (.0161)		-.0151 (.0151)		-.0095 (.0201)
Announcement effects							
	Treated	.0245** (.0122)	.0375** (.0161)	.0253* (.0113)	.0310** (.0151)	.0430** (.0179)	.0582** (.0257)
	T_kids		-.0163 (.0121)		-.0074 (.0125)		-.0158 (.0201)

Reported coefficient is for indicator variable for “being in treatment group” interacted with “after”. Regressions include cubic in mother’s age interacted with education; # kids interacted with mother’s age, education and age of the youngest child; region; housing tenure; ethnicity; 25th and 75th percentiles in male and female wage distribution.

Robustness checks

- Estimate with no trend terms
- Control for differential trends using the derived fertility histories to extend pre-period back to 1985
- Using longer period, estimate effects of spurious reforms in 1995 and 1996
- No significant change in age at first birth
- Regression on all women has negative insig impact for single women

Conclusions

- Evidence suggests a significant increase in first births among low-education women in couples in response to WFTC and other changes
 - Range of 1.2 -3.6 ppts increase in birth probability.
 - 1.2 ppts is 10% rise; nearly 20,000 extra births/year (c2-3% of all births)
- Is this plausible?
 - Changes were large (46% increase in child-contingent support; 10-12% rise in net income in bottom quintile of families with children)
 - In summer 2000 (2001), 33% (42%) of low/moderate-income couples not receiving WFTC were aware of it
- Is it plausible that increased child-contingent benefits would not affect fertility?



End



Treatment and control groups

- Education
 - Treatment: Both male and female partner left school at/before compulsory school leaving age
 - Control: Both male and female partner left school at 18+
- Income
 - Treatment: Household earnings put household in bottom third
 - Control: Household earnings put household in top third
- Income/ education
 - Treatment: Education treatment and income treatment
 - Control: Education control and income control
- Female education
 - Treatment: Woman left school at/ before compulsory school leaving age
 - Control: Woman left school at 18+



Definition of Before and After

- WFTC announced March 1998 and introduced October 1999
- Assuming no announcement effects
 - Before = interviews 1st April 1995 – 30th June 2000
 - After = interviews 1st August 2001 – 31st December 2003
- Announcement effects?
 - Before = interviews 1st April 1995 – 31st December 1998
 - After = interviews 1st August 2001 – 31st December 2003

Regression analysis

$$\text{Pr}(\text{Birth}_{it}) = \alpha_0 + \beta_1 \text{Low_ed} * \text{Post} + \beta_2 \text{Low_ed} + \beta_3 \text{Post} + \gamma_1 t + \gamma_2 t * \text{Low_ed} + \gamma_3 t * \text{Post} + X_{it}\delta + u_{it}$$

Controls

Cubic in mother's age, interacted with education;

Number of children in the household, interacted with the age of the mother and with the age of the mother and education and with the age of the youngest child;

Region and housing tenure

Woman's and partner's ethnicity

25th and 75th percentiles in male and female wage distribution