



Institute for
Fiscal Studies

The gender pay gap in the UK: children and experience in work

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Motivation

- Women's pay is, on average, lower than that of men (even after controlling for education, age, current working hours, ...)
- They also experience different career patterns than those of men
- Points to the potential importance of careers in explaining pay differentials

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- Women's pay is, on average, lower than that of men (even after controlling for education, age, current working hours, ...)
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- Points to the potential importance of careers in explaining pay differentials
- This project investigates the role of gender differences in career patterns in explaining the gender pay gap
 - Important because women are at a comparatively high risk of poverty, particularly as mothers of young children
 - Women are more responsive to financial incentives to work than men
 - Potential role for policy to mitigate gender pay differentials by affecting the career choices of women

Aims of this research

- Document evolution of gender pay gap in the UK over the past 25 years
- Show how it relates to the career patterns of men and women, and how childbirth interacts with careers and pay
- Isolate the causal role of full-time and part-time experience in determining the wages of men and women
- Draw out the implications for what experience differences can and cannot explain about the gender wage gap over the life cycle
- Examine how this differs by education

Aims of this research II

This is part of wider research project

- Focus on three major sources of career differences, all associated with periods of child-rearing
 1. Women spend less time in paid work, which may dent their skills and productivity
 2. They may value job amenities other than pay by more than men do, which affects sorting into different types of jobs – we consider job location
 3. Their more frequent career interruptions may compromise their bargaining position in work
- Aim is to measure the role of these mechanisms in driving pay progression and in explaining gender differences in pay

Will briefly come back to this at the end

Background

- Vast literature on women's wages and gender disparities in pay describes secular convergence in wages (Goldin 2014, Goldin and Mitchell 2017)
- ... Establishes relationship between careers and fertility (Bertrand Goldin and Katz 2010, Adda, Dustmann and Stevens 2017, Kleven, Landais and Sogaard 2017...)
- ... And between certain job characteristics and the relative wages of women (Goldin and Katz 2016, Card, Cardoso and Kline, 2016)

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This project contributes to this literature by showing how skills accumulated in work and the sorting of workers to different types of jobs shape wage progression and gender differences in pay

The household panel data

BHPS (1991-2008) and USoc (2009-2015)

- Unbalance panel of over 12,000 men and 15,000 women aged 20-50 and observed at least twice
- Measures of education, labour market outcomes, childcare, detailed demographics, assets, and linked life histories
- Detailed geographical location data for residence and a measure of travel time to work

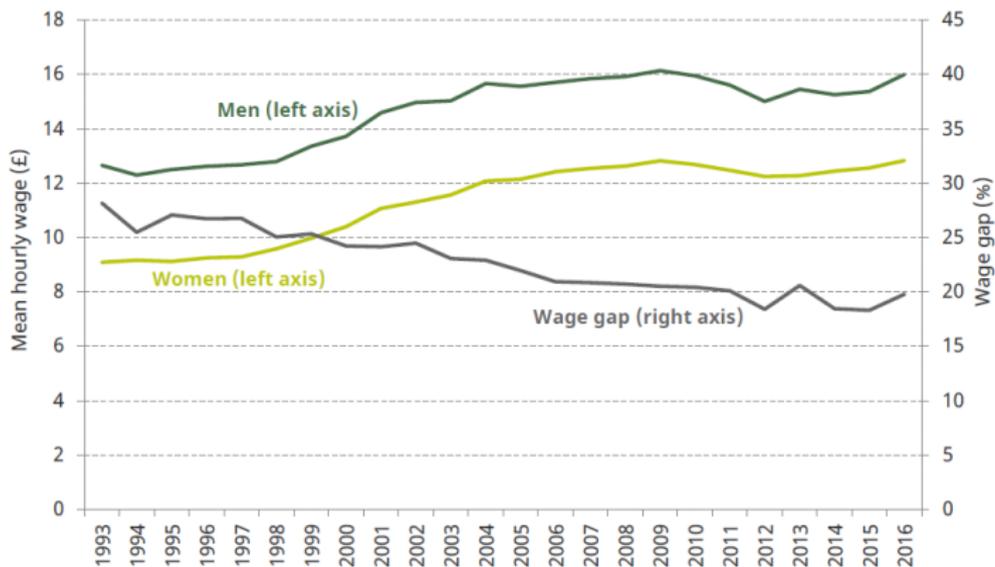
Gender disparities on hourly wage rates

- Usual weekly pay by usual weekly hours + overtime in main job
- Exclude self-employment
- Wages net of average wage growth and trimmed (2%-99%)

Bins in weekly hours: no work (<5), part-time (5-25) and full-time (26+)

Steady convergence but disparities remain high

Hourly wages and the gender pay gap (real terms, January 2016 wage levels)

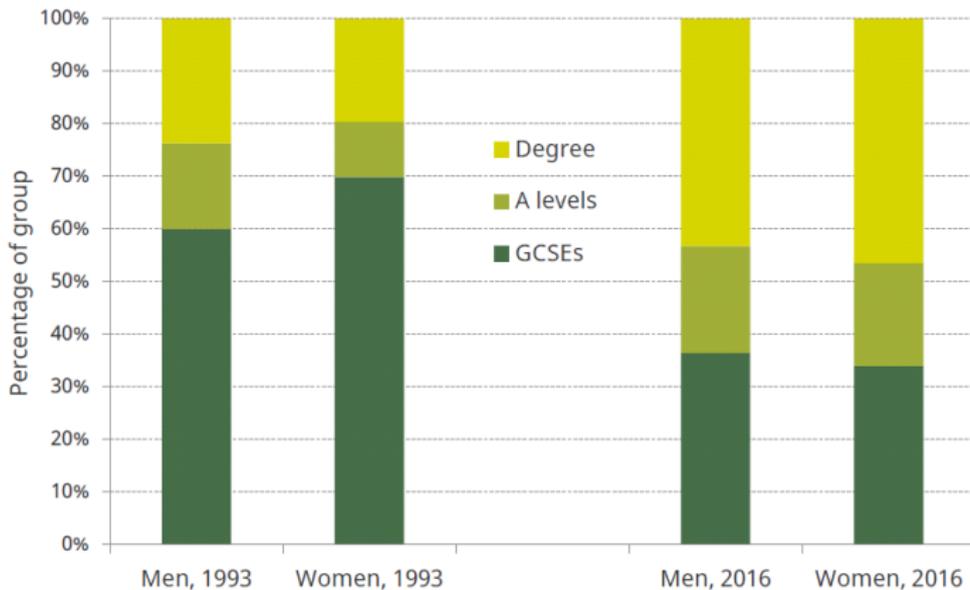


Labour Force Survey, 1993-2016

From Figure 1 of www.ifs.org.uk/uploads/publications/bns/BN223.pdf

Convergence in education attainment may have contributed to close the gap

Women's education levels have been increasing especially rapidly

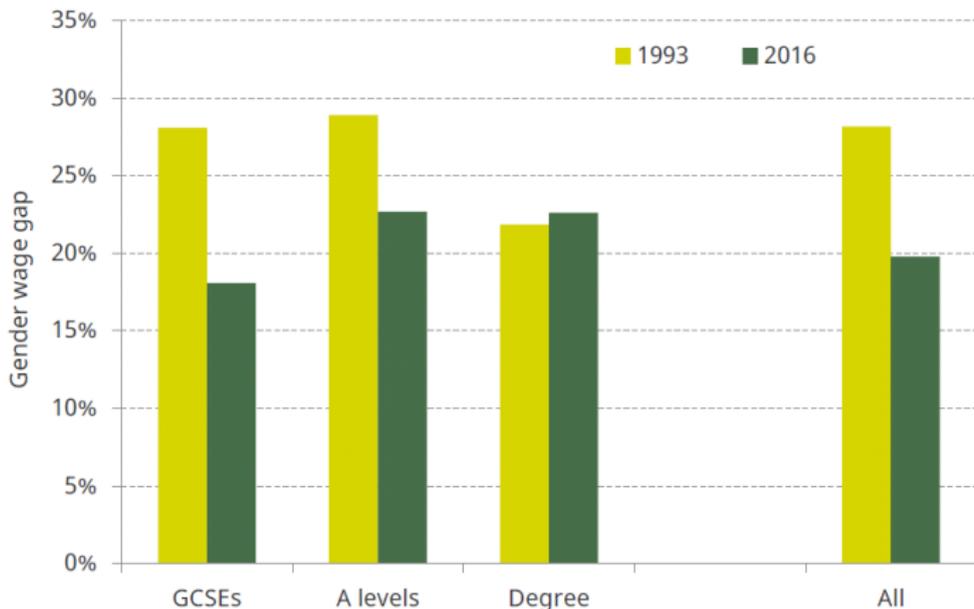


Labour Force Survey, 1993 and 2016

From Figure 1 of www.ifs.org.uk/uploads/publications/bns/BN223.pdf

Convergence confined to lower education groups

They now exhibit smallest gap



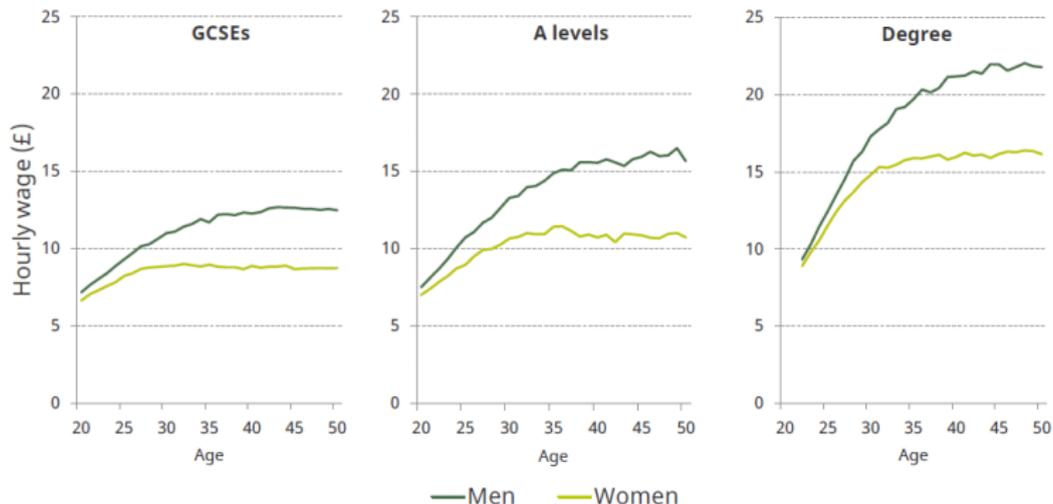
Labour Force Survey, 1993 and 2016

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Gender gap widens over the life-cycle

Differences in pay progression are key

Association between age and wages breaks down for women in their 30s



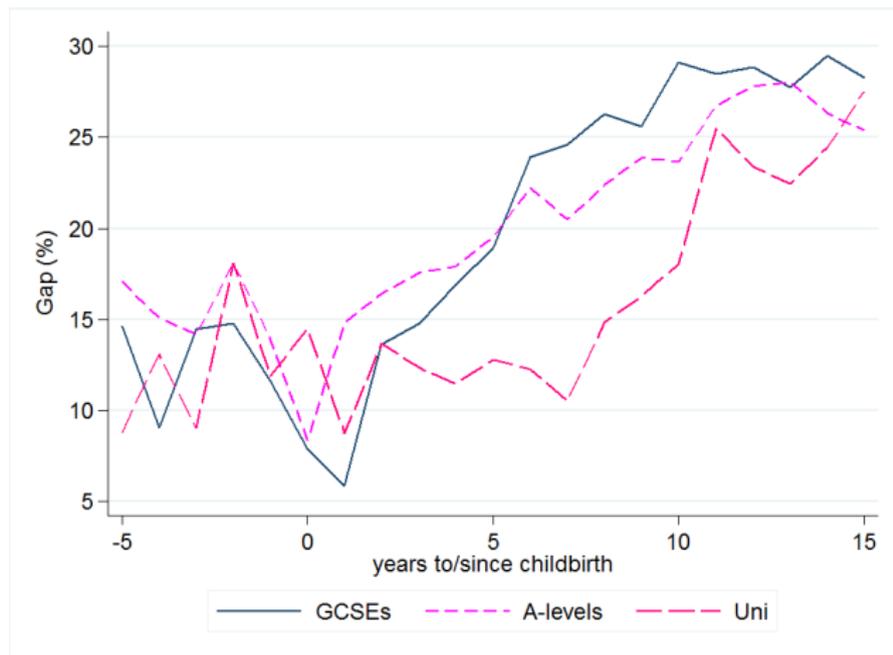
LFS 1993Q1-2017Q2.

From Figure 4 of www.ifs.org.uk/uploads/publications/bns/BN223.pdf

The arrival of children has much to do with this

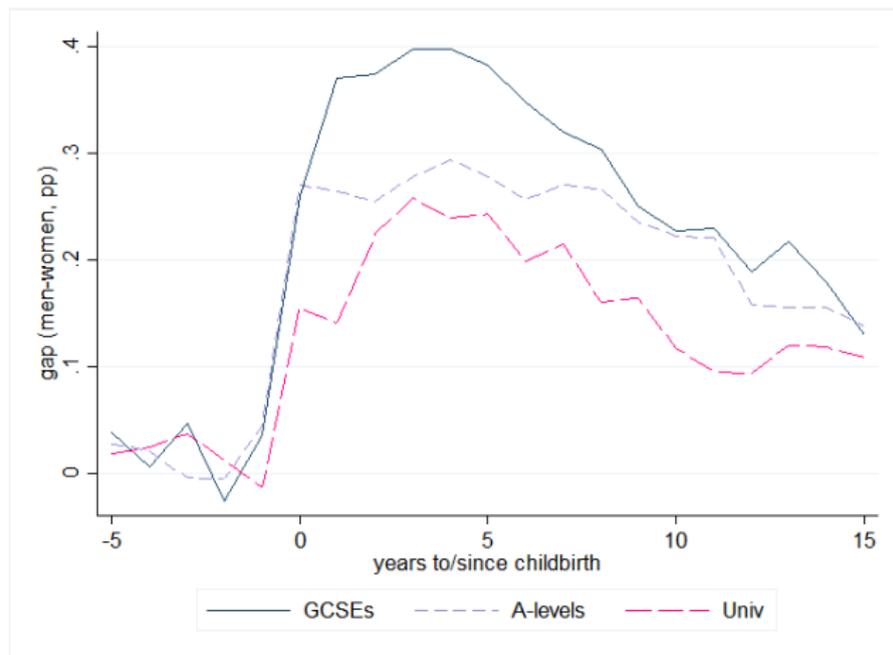
Not via any sudden jump in the gap, but because it is the start of a long, gradual widening

Wage gender gap before and after the birth of the first child



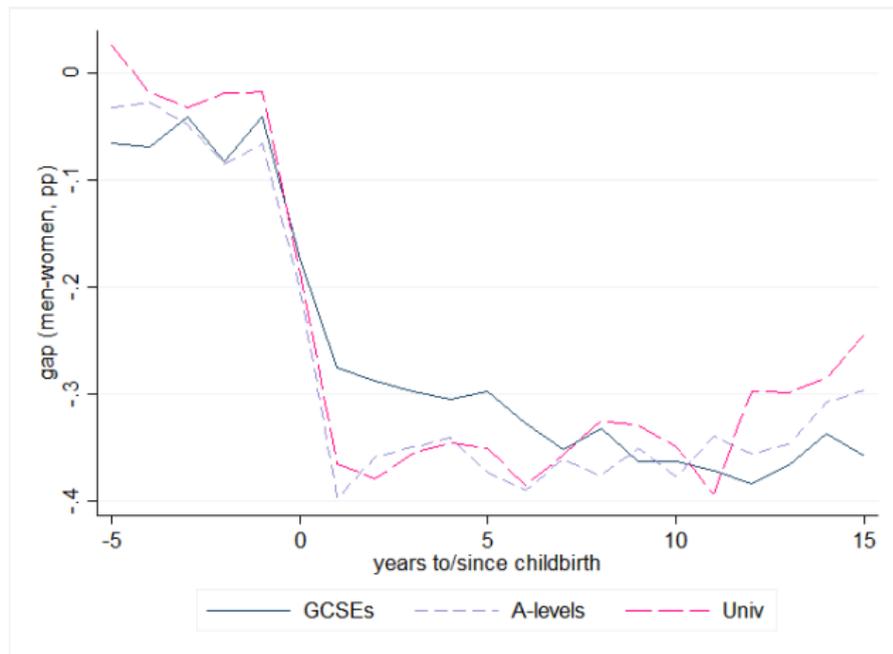
Breaks in careers seem to be one factor

Gender gap in employment rates before and after the birth of first child



And working hours may also play a role

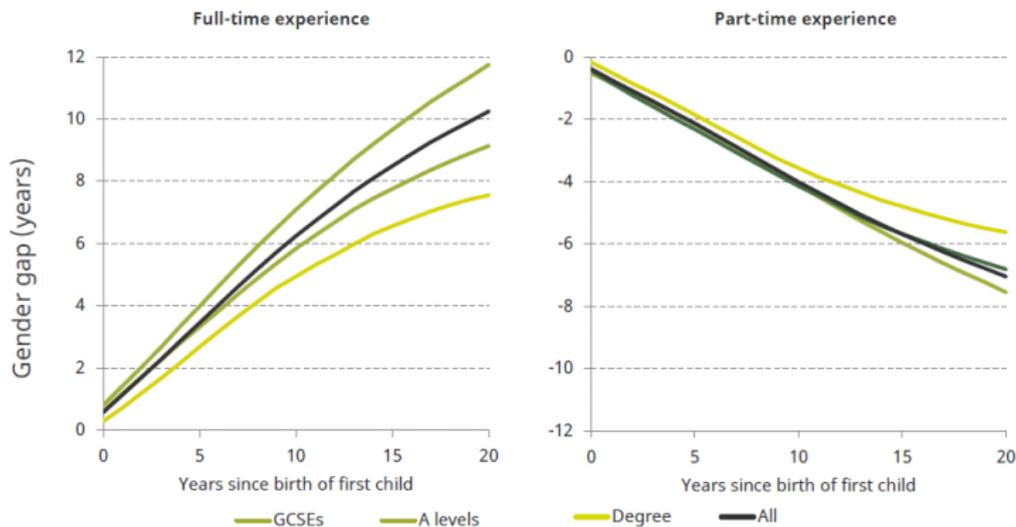
Gender gap in proportion of workers in part-time jobs before and after the birth of first child



Gender differences in working patterns accumulate to large differences in work experience

Gradual widening of experience gaps after childbirth, similar to evolution of the wage gap

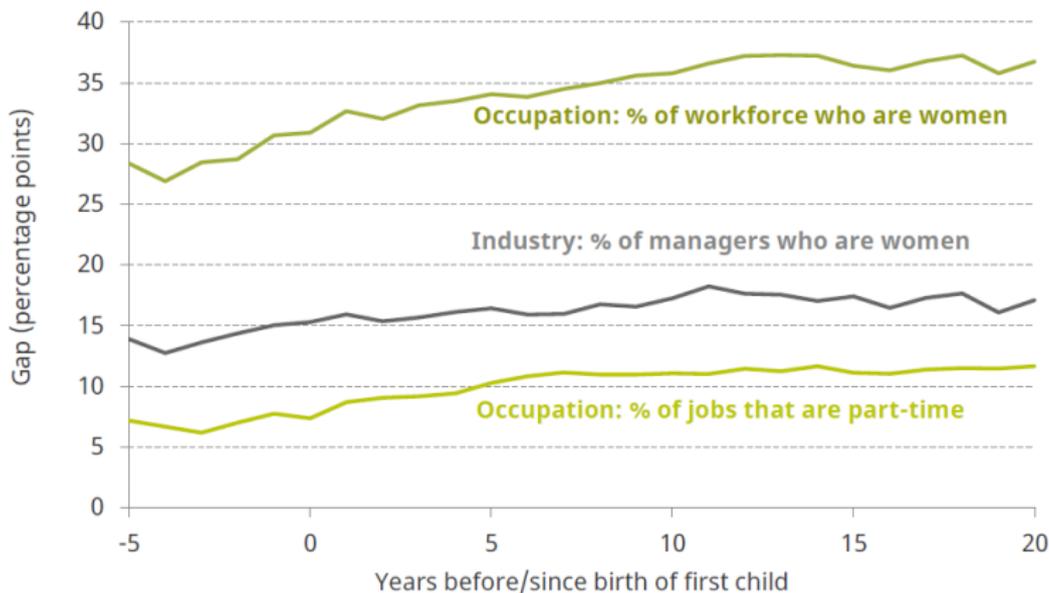
Gender differences in accumulated experience before and after first birth



Gender differences in industries and occupations

Gradual changes happen before and after childbirth at a similar pace

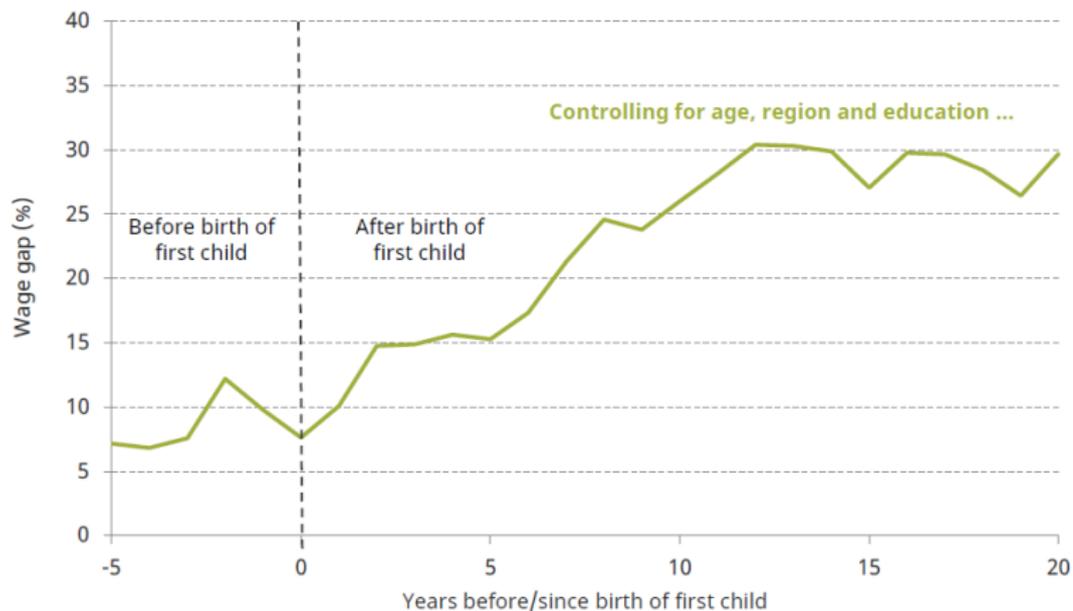
Gender differences in some characteristics of jobs



A simple descriptive look at the data suggests that experience differences may be the bigger factor

Gender pay gap before and after the birth of the first child

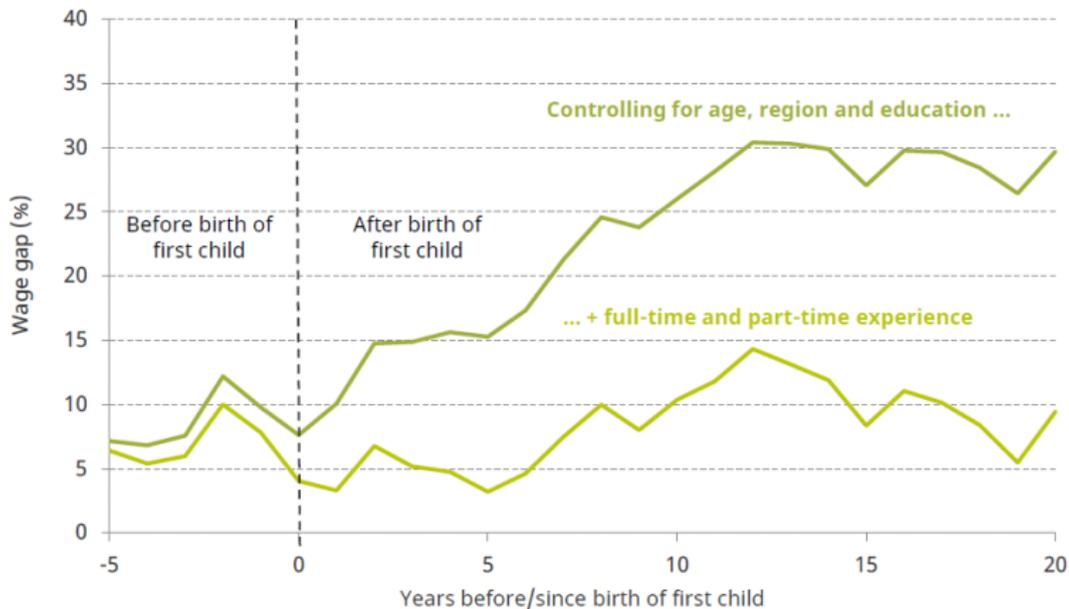
After controlling for age, region, education



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Gender pay gap before and after the birth of the first child

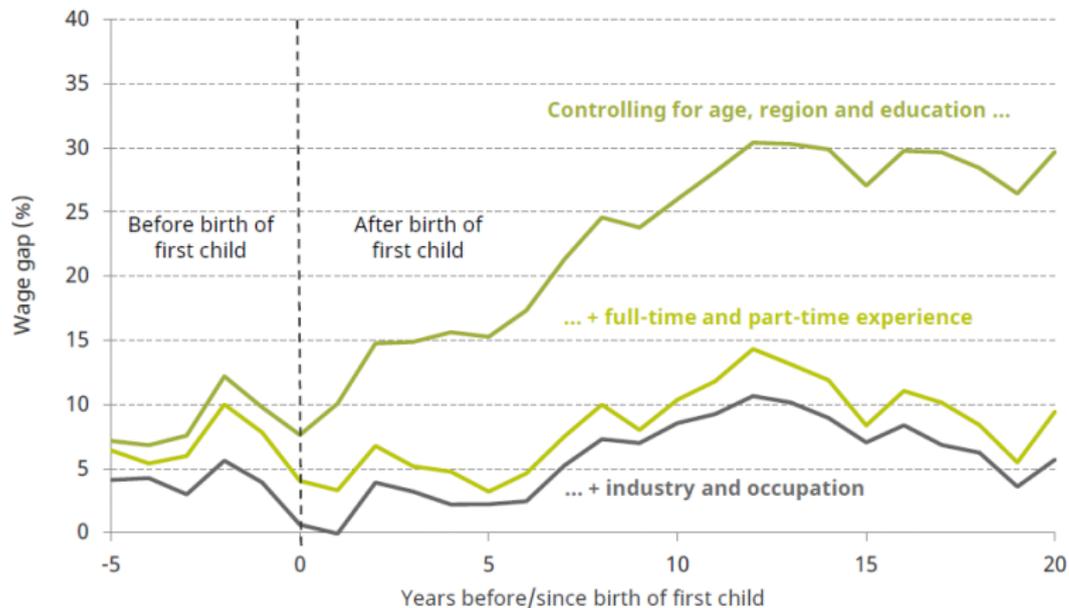
.. And working experience



A simple descriptive look at the data suggests that experience differences may be the bigger factor

Gender pay gap before and after the birth of the first child

... And industry, occupation



Measuring the causal role of working experience for wage differentials

- Estimate the effect of working experience on the wages of women
- Simple model of wages and human capital formation in work – experience
- Workers enter the labour market with no human capital accumulated through working experience

$$h_{i1} = 0$$

- They accumulate human capital in work, at a rate that depends on education, working hours – full/part-time – and accumulated experience
- The growth rate in human capital while in work is

$$\Delta \ln(h_{it} + 1) = \alpha_s(e_{it-1})P_{it-1} + \gamma_s(e_{it-1})F_{it-1}$$

Measuring the role of working experience for wage differentials II

- Hourly-wages depend on education, human capital and an error

$$w_{it} = W_s \times (h_{it} + 1) \times v_{it}$$

- So the growth rate in wages for continuously working individuals is

$$\Delta \ln w_{it} = \alpha_s(e_{it-1})P_{it-1} + \gamma_s(e_{it-1})F_{it-1} + \epsilon_{it}$$

- To allow for declining accumulation of HC, we specify

$$\alpha_s(e_{it}) = \alpha_{s1} + \alpha_{s2} e_{it-1}^F$$

$$\gamma_s(e_{it}) = \gamma_{s1} + \gamma_{s2} e_{it-1}^F$$

where e^F is years in full-time work

Measuring the role of working experience for wage differentials III

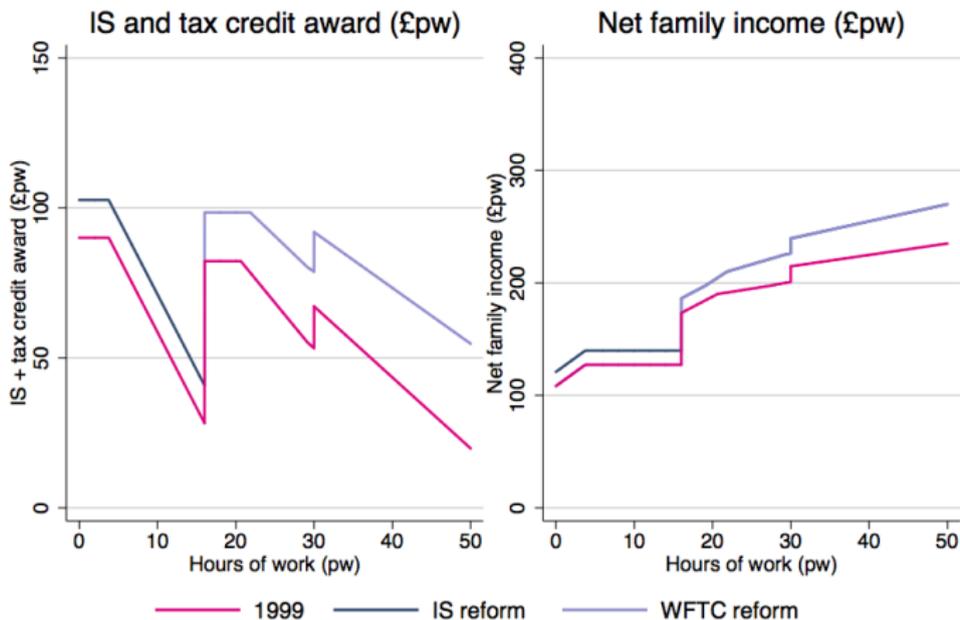
- The wage regression is

$$\Delta \ln w_{it} = \alpha_{s1} P_{it-1} + \alpha_{s2} P_{it-1} e_{it-1}^F + \gamma_{s1} F_{it-1} + \gamma_{s2} F_{it-1} e_{it-1}^F + \epsilon_{it}$$

- Issues that need to be addressed in estimation
 - Those working and working full-time hours may be on a different wage trajectory: [use tax instruments for part-time and full-time simulated incomes](#)
 - Those with more experience may also be on a different wage trajectory: [use age and age of oldest child to instrument experience](#)

The UK Tax Credit and Income Support Reform 1999

Figure: single mother with 1 child



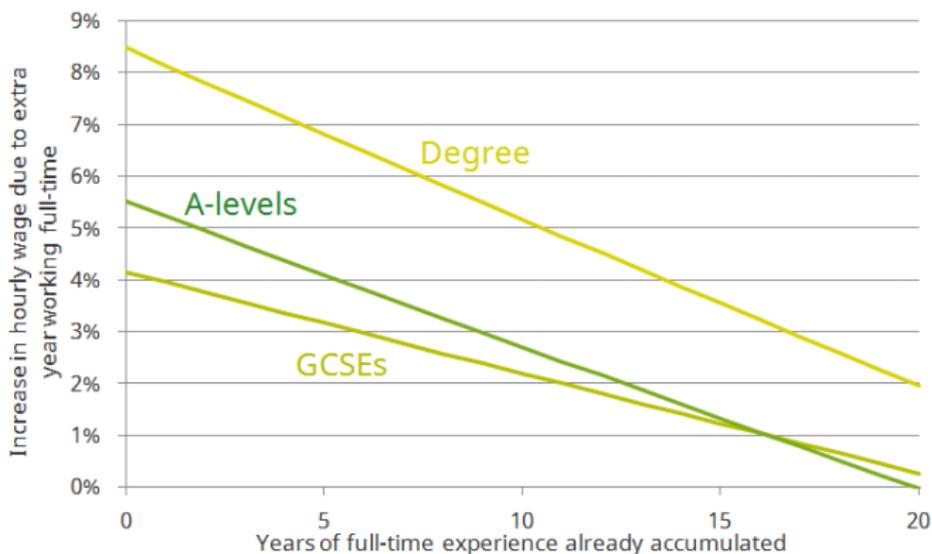
Note: Off-setting income effect for mothers in couples.

Estimates: wage regression in first differences for women

	HS dropouts	HS graduates	Univ graduates
lag PT	-.007 (.0100)	-.019 (.0175)	.013 (.0296)
× lag eF	-.001 (.0010)	.000 (.0013)	-.001 (.0030)
lag FT	.040** (.0076)	.053** (.0070)	.081** (.0150)
× lag eF	-.001** (.0003)	-.002** (.0003)	-.003** (.0004)
N	7,339	5,775	2,909

Growth rates in wages by experience: women

Full-time experience has big causal effect on wages – esp. for graduates

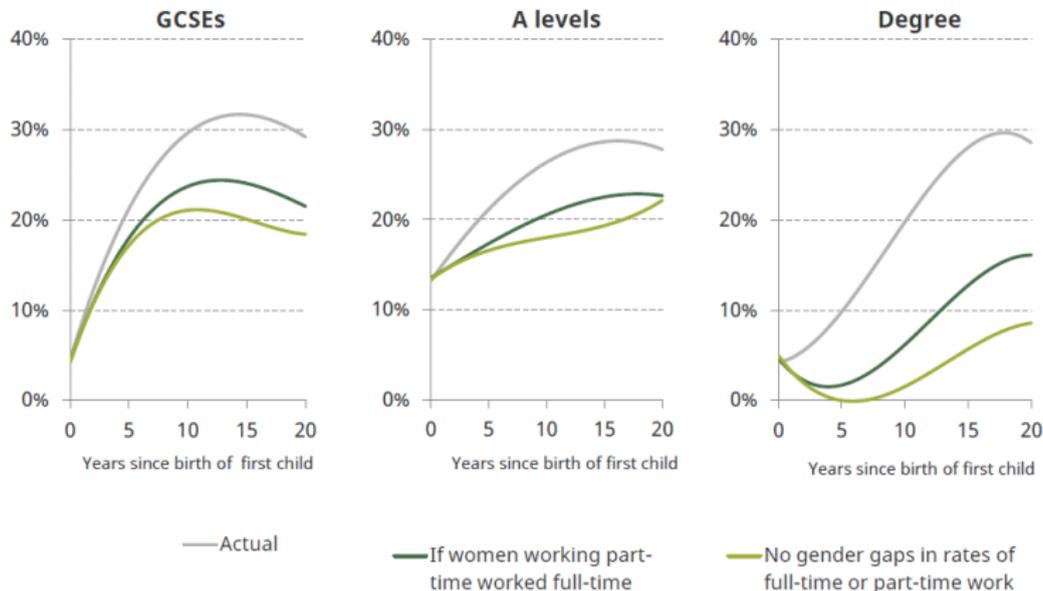


Simulate role of experience for the widening of gender pay gap among parents

- Use estimates to assess the role of experience gaps building up after childbirth in driving gender wage differentials
- Construct counterfactual human capital since start of life under alternative working patterns
 - PT is same as FT
 - Women work at same rate as men
- Then construct counterfactual wages for *women in work* by netting out predicted HC and adding counterfactual HC
- So changing selection with age of child will remain in the simulations

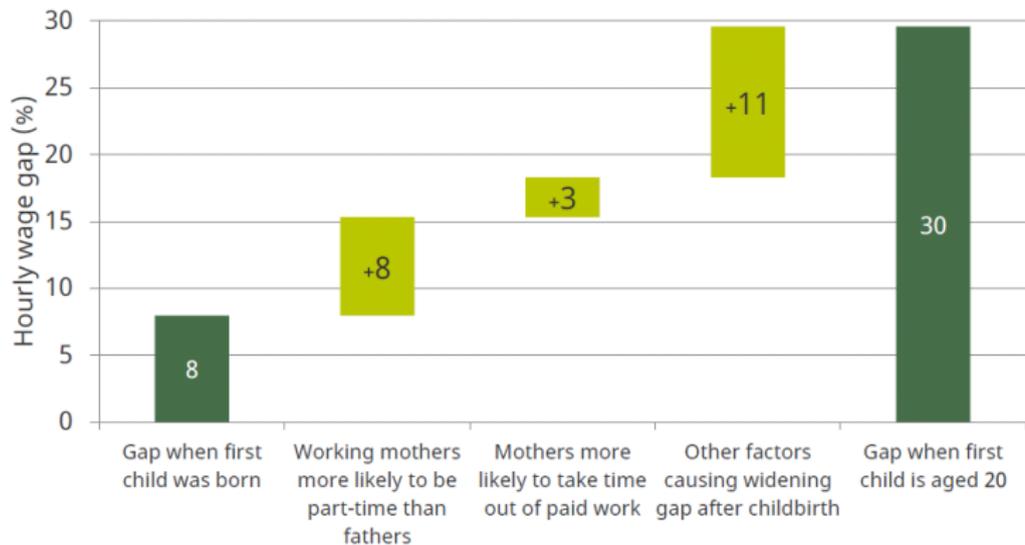
Gender wage gap without gender differences in hours of work after childbirth

Counterfactual gender pay gap by time since first childbirth



Gender wage gap without gender differences in hours of work after childbirth

Decomposing the difference in hourly wages between mothers and fathers once the first-born child is grown up



Summary and next steps

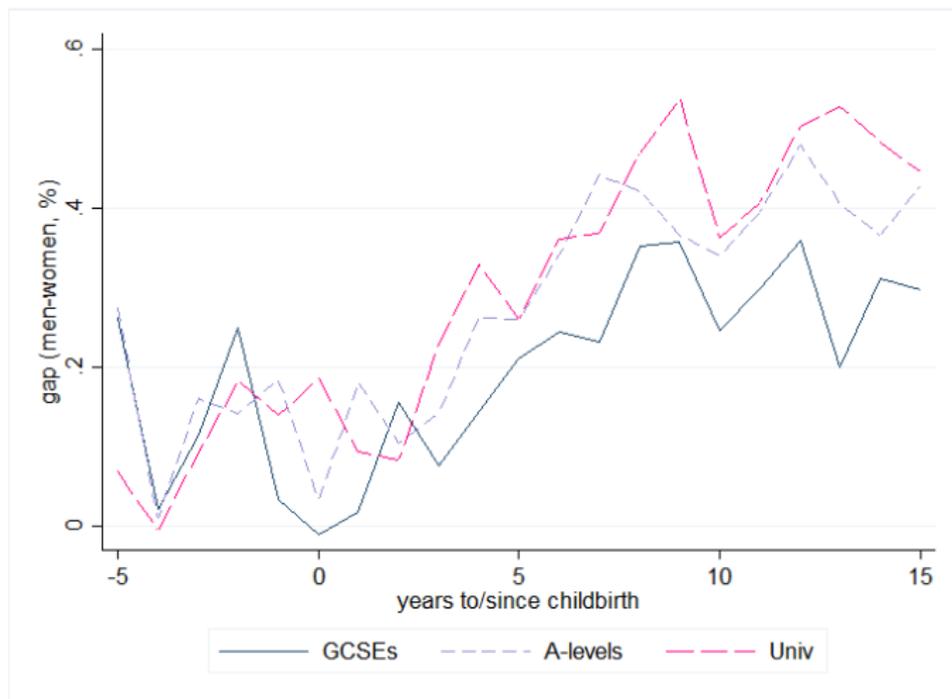
- Experience matters for wages and it explains a substantial part of the gender wage gap - especially its evolution over the lifecycle
- The large difference between the effects of part-time and full-time experience is key

Summary and next steps

- Experience matters for wages and it explains a substantial part of the gender wage gap - especially its evolution over the lifecycle
- The large difference between the effects of part-time and full-time experience is key
- But we have also shown that employment and hours of work cannot explain a significant share of the gender wage gap – particularly for those with less formal education
 - It may be related to changes in job characteristics or women's bargaining position around childbirth
 - We look at job location: travel-to-work time

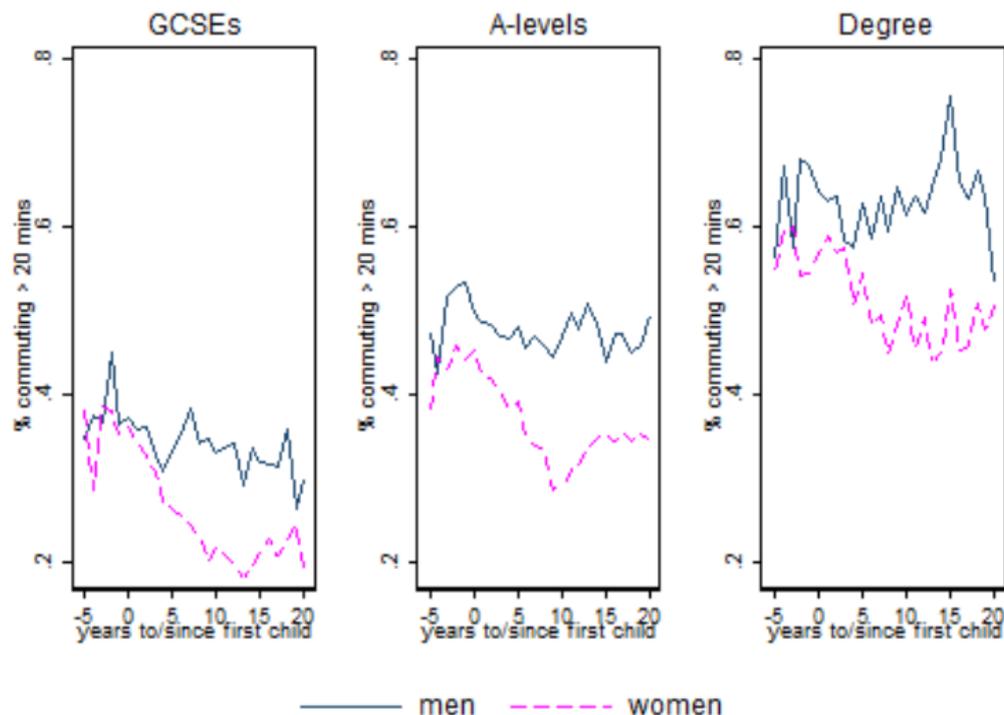
The gender gap in travel-to-work time changes markedly with childbirth

Gender gap in travel-to-work time around the birth of first child



And that holds for all education groups

Proportion commuting for longer than 20' around the birth of first child, by education



Travel-to-work time is associated with higher job separations after childbirth

Effect of working 'far' from home on the employment probability of women, by years after birth of first child

	coef	st.err	N
year 1	-.083**	.035	670
year 2	-.076**	.038	603
year 3	-.079*	.042	529
year 4	-.121**	.046	468
year 5	-.114**	.051	409

Regression also controls for log wages prior to birth and education.

'Far' means more than 20 minutes away from home (more than 50% of women employees work 20 or fewer minutes away from home)

Travel-to-work time is associated with higher wages

Wage premium for distance in minutes: women 20-50

	HS dropouts	HS graduates	Univ graduates
Travel-to-work (min)	.0060** (.0002)	.0046** (.0003)	.0028** (.0003)
× young kid 0-4	.0013** (.0005)	.0029** (.0006)	.0012* (.0007)
× young kid 5-10	.0007 (.0005)	.0022** (.0007)	.0042** (.0010)
obs	12,164	10,585	5,201

Regressions also controls for youngest kid in age groups 0-4 and 5-10.

What we found so far

- Mothers work within narrower radius of home after childbirth
- Are more likely to drop working if travel-to-work time is higher
- And there is a pay-premium for travel-to-work-time, which is higher for mothers
- We will investigate how these patterns relate to the kinds of jobs mothers sort into, and their ability to extract rents