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Exploring the Reasons for Labour Market Gender Inequality a Year into the Covid-19 Pandemic: Evidence from the UK Cohort Studies

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Abstract

The Covid-19 pandemic has caused unexpected disruptions to Western countries which affected women more adversely than men. Previous studies suggest that these gender differences are attributable to two main causes: women being over-represented in the most affected sectors of the economy and women, especially mothers, taking a bigger share of housework and childcare responsibilities following school closures. Using the data from four British nationally representative cohort studies, we test these two propositions. Our findings confirm that the adverse labour market effects of the covid-19 pandemic were still experienced by women a year into the covid-19 pandemic and that these effects were the most severe for women who lived with a partner and children. We show that adjusting for pre-pandemic job characteristics substantially attenuates the gaps, suggesting that women were over-represented in jobs disproportionately affected by covid-19 pandemic. However, the remaining gaps are not further attenuated by adjusting for the partner's job characteristics or the number and age of children in the household, suggesting that the adversities experienced by women were not driven by their relative labour market position, as compared to their partners. The residual gender differences observed in the rates of active, paid work and furlough for those who live with partner and children point to the importance of unobserved factors such as social norms, preferences, or discrimination. These effects may be long lasting and jeopardise women's longer-term position through the loss of experience, leading to reinforcement of gender inequalities or even reversal of the progress towards gender equality.

Keywords: Covid-19; Pandemic; Gender; Employment; Furlough
JEL codes: J16; J22

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Key messages:

- Adverse labour market effects of covid-19 were still experienced by women a year into the pandemic
- These effects were the most severe for partnered women with children
- Job characteristics attenuate the gaps implying women were over-represented in affected jobs
- Partner's job and children do not attenuate the remaining gaps suggesting adversities were not driven by women's jobs as relative to partners

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Data availability statement:
Wielgoszewska takes the responsibility for the integrity of the data and the accuracy of the analysis. Data has been collected by the the Centre for Longitudinal Studies (CLS) and can be accessed at https://beta.ukdataservice.ac.uk/datacatalogue/studies/study?id=8658. Data should be cited as: University College London, UCL Institute of Education, Centre for Longitudinal Studies. (2021). COVID-19 Survey in Five National Longitudinal Cohort Studies: Millennium Cohort Study, Next Steps, 1970 British Cohort Study and 1958 National Child Development Study, 2020-2021. [data collection]. 3rd Edition. UK Data Service. SN: 8658, http://doi.org/10.5255/UKDA-SN-8658-3

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1. Introduction

The Covid-19 pandemic has caused unexpected disruptions to Western countries. The rapid spread of the virus led governments to introduce social distancing and mitigation measures that limited economic activity. In the UK, a series of national lockdowns that started in March 2020 forced closures of some sectors and substantially reduced the economic activity in others. GDP fell by 19.5% in the second quarter of 2020 – the largest fall since the ONS statistics were first recorded in 1955. Although the UK's economy partially recovered by the first quarter of 2021, GDP levels were as low as in 2014 (ONS, 2021).

Government responded to the economic downturn with radical labour market interventions. In March 2020 it launched the Coronavirus Job Retention Scheme (CJRS) - a furlough scheme, which entitled employees to 80% of pay up to a cap of £2,500 per month. This scheme supported workers whose ability to work was severely impaired (either because they worked in sectors of the economy that were forced to cease or reduce operations, or because they had caring responsibilities that could no longer be outsourced), while office workers were more likely to shift to working from home and key workers in health, education, and public services to continue working at their workplaces.

In previous economic downturns employers were forced to issue redundancies, but the furlough scheme allowed them to retain workers in post, even though they were unable to work. The steep drop in employment levels reached almost 10 million by early May 2020, but the employment gap was almost fully comprised of furloughed workers. The scheme did not allow furloughed employees to work at all initially, but from July 2020 businesses had the flexibility to bring employees back on a part-time basis. By May 2021, the employment drop compared to the start of the pandemic was around 3 million and the gap comprised of fully and partially furloughed workers as well as fall in payroll employees (Brewer, 2021).

Research suggests that in the early phases of lockdown women's employment was disproportionately adversely affected (Madgavkar, White, Krishnan, Mahajan, & Azcue, 2020). This contrasts to earlier recessions where men's employment rates were more strongly impacted (Hoynes, Miller, & Schaller, 2012). As a result, some have labelled the downturn induced by covid-19 as a "shecession" (Alon, Coskun, Doepke, Koll, & Tertilt, 2021).

Gender differences between Covid-19 and previous recessions have been attributed to two main causes. Firstly, the pandemic severely affected the service sectors, such as hospitality and tourism, which have been less sensitive to decline of economic activity in previous recessions than, for example, manufacturing. Alon et al. (2021) argue that women were disproportionately employed in the affected sectors. However, other female-dominated sectors, such as health and social care, faced increased demand.

Secondly, school closures and restrictions on social contact meant families faced increased childcare needs and competing pressures on their time to replace services that were formerly outsourced. Evidence from early stages of the pandemic shows that men and women with no dependent children at home were equally likely to have stopped work, but mothers with children of primary school age or younger were significantly more likely to stop working, as compared to fathers with children of the same age (Wielgoszewska, Green, & Goodman, 2020). Mothers were spending substantially longer in childcare and housework than their partners and were more likely to be juggling paid work and childcare (Andrew et al., 2021; Sevilla & Smith, 2020).

In this study we provide evidence on how the pandemic crisis affected gender inequalities in employment and furlough rates in different types of households. We investigate the reasons for these differences by exploring two hypotheses: 1) an occupational segregation hypothesis, which posits that gender differences in job characteristics are responsible for varying employment and furlough rates; 2) an efficient household hypothesis, which posits that, amongst couples, additional domestic responsibilities were being shouldered by the person with lower earnings potential.

We contribute to the existing literature in several ways. Firstly, whilst most existing research focuses on the period of the first national lockdown, we examine data collected between February and March 2021. By looking at effects one year after the initial restrictions were imposed, we provide a view on whether the initial gender gaps still existed a year later. Secondly, while previous studies mainly focused on couples with children, we show how gender effects vary across different types of households. Our findings confirm that women's employment was more likely to suffer the effects of covid-19 pandemic than men's. The effects were the most severe for women who lived with a partner and children. We also find some support for the importance of occupational segregation, but little support for the efficient household hypothesis. The remaining residual differences between men and women point to alternative explanations that are less straightforward to test directly, such as social norms, gender differences in preferences, or employer discrimination.

The remainder of the paper in structured as follows. The hypotheses are developed and linked to the existing literature in the next section. In the subsequent section we provide details of the data and methods used in this study. We present the results in the penultimate section. The final section discusses these results in the context of our hypotheses, provides alternative explanations for the residual gaps, and concludes.

2. Previous literature and hypotheses

Occupational segregation:

Women are concentrated in different occupations to men and, historically, this segregation has worked to women's disadvantage (Preston, 1999). Although female-dominated occupations have been less vulnerable to previous recessions, this recession had greater effects on sectors where women are heavily concentrated, such as travel, accommodation, and services (Cotofan, De Neve, Golin, Kaats, & Ward, 2021). At the same time, women are also more likely to work in job that remained essential during the pandemic. Globally women form 70% of workers in the health and social sector (Boniol et al., 2019) and in the UK approximately 60% of key workers are women, which is driven substantially by women working in health and social care, education and childcare (Zhou, Hertog, Kolpashnikova, & Kan, 2020).

Previous studies suggest that occupational segregation may partly, but not fully, explain the gender gaps in how the working status of individuals changed with the lockdown (see for example Albanesi & Kim, 2021). For example, Alon et al. (2021) in their international comparison found that, even after controlling for work type, there has been a large and significant gender gap in terms of hours among parents of school age children in Spain. While similar patterns were observed using UK data, the estimates were not statistically significant. Andrew et al. (2021) compared mothers and fathers of school-age children living in opposite-gender couples in England, and who were active in work before the pandemic, in February 2020. They found that mothers were more likely than fathers to

stop working during the first lockdown, but this was not driven by mothers working in jobs that were structurally more vulnerable to the demand-side shocks.

Another aspect that typically differentiates the jobs on men and women is the prevalence of part-time work. As shown by Joshi, Bryson, Wilkinson, and Ward (2019) by the age of 55 women born in 1958 on average accumulated 10 years of part-time experience compared with just 7 months for men. Between April and June 2020 part-time workers were over twice more likely to lose their jobs, and 70% more likely to be furloughed than full-time workers (Şandor, 2021). They were also more likely to experience another labour market shock in the second half of 2020 (A. Wenham & Şandor, 2021). At the same time, other studies suggest that women are more likely to work in jobs that can be done from home, thus providing opportunities for on-going employment even during lockdown (Hatayama, Viollaz, & Winkler, 2020; Hupkau & Petrongolo, 2020).

If gender differences in pre-pandemic occupations and part-time status lie behind the differential impact of the pandemic, we expect that accounting for job characteristics would reduce the gender differences in employment and furlough rates. Our first hypothesis tests this proposition:

H1: Gender difference in employment and furlough rates are related to women being over-represented in jobs disproportionately affected by covid-19 pandemic.

Efficient household allocation:

The idea of efficient household allocation can be traced back to Becker (1965) who proposed that, amongst couples, the allocation of labour in the household reflects the comparative advantage of partners in domestic and labour market. At the time Becker was writing, men often had more education and work experience than women, and it was rare to challenge the proposition that women were more productive at organizing the household and caring for dependent children. Thus, from an economic efficiency perspective, it made sense for women to stay at home whilst men spent most of their time in paid employment.

Recent studies provide evidence of continuing labour market disadvantage of women, especially following the birth of first child. Typically, when the first child arrives, women either take a break from employment or switch from full to part-time work, which is often less-well paid in absolute terms (i.e., per hour). In their investigation of the pay gaps in the cohort born in Britain in 1958, Joshi et al. (2019) find that the initial gap between men and women widened substantially during childrearing years, which is attributable to divergent work experience, especially in mid-life. Similarly, Costa Dias, Joyce, and Parodi (2018) find that, in the UK, the gender wage gap opens up gradually after the first child arrives and among employees continues to widen for many years after that point.

Covid-19 caused further impediments to labour supply with the pressures from domestic responsibilities, due to enforced schools' closures for prolonged periods and the expectation that parents would home-school their children. Recent evidence shows that this disproportionately negatively affected the working status and employment of mothers of young children, while fathers of similar aged children were actually less likely to experience job loss than other men (Furman, Kearney, & Powell, 2021). Benzeval et al. (2020) shows that, during the initial stages of the pandemic, parents spent considerably longer actively helping primary school age students, than those in secondary education. Similarly in the US, Collins, Landivar, Ruppanner, and Scarborough

(2020) found that, during the covid-19 pandemic, mothers with young children reduced their work hours four to five times more than fathers resulting in a growth in the projected gender hours gap by 20–50 per cent. Similarly, The effects on productivity and engagement in employment were particularly detrimental for single parents (Hertz, Mattes, & Shook, 2020), most of whom are mothers with particularly low, pre-covid employment rates (Blundell, Costa Dias, Joyce, & Xu, 2020). Single parents spent more time on housework but not on childcare and home schooling than multiple adult households (Benzeval et al., 2020).

The furlough scheme provision, although designed to protect the jobs of those who were the most vulnerable, might have reinforced gender asymmetries in the allocation of paid and unpaid work. In line with the efficient household allocation hypothesis, the incentive to request leave for caring purposes may be stronger for women than for men if they are the main carer and/or the second earner in couples, minimising the potential loss of household income. Indeed, Andrew et al. (2021) found the biggest gender gaps in furloughing status, for the specific case where the worker could choose whether or not to furlough (as opposed to furloughing because their jobs were temporarily shut down). This suggests that decisions taken within the family about how to organise domestic and paid work could have played a key role in driving gender gaps in participation during the lockdowns. Since individuals who work longer hours are disproportionately highly rewarded (Goldin, 2014), this incentive could be especially desirable if women were only employed on a part-time basis.

There is still scant evidence on how couples organised paid and unpaid work during the pandemic, and whether they prioritised the financial wellbeing of the family in view of the mounting demands on the time of parents. Two studies using British data consider how families allocated responsibilities for paid and domestic work between partners, during the pandemic. Qian and Hu (2021) find an increase in sole-worker families with the better-educated partner remaining in work, irrespective of gender, as might be expected under efficient household allocation hypothesis. Andrew et al. (2021), on the other hand, find that mothers reduced their hours by more than fathers did, even if they continued to work, and even if they were better paid than their partners or used to work more hours than their partners pre-pandemic. To compensate, they always did more housework and childcare.

If gender differences in household distribution of responsibilities lie behind the differential impact of the pandemic, we expect that accounting for partner's job as well as the presence and age of children in the household would reduce the remaining gender differences in employment and furlough rates. Our second hypothesis tests this proposition:

H2: Gender difference in employment and furlough rates are related to women's comparative labour market disadvantage and the scale of domestic responsibilities.

3. Data and methodology

Sample:

Our data are extracted from four nationally representative cohort studies for Britain. The oldest cohort we use is the National Child Development Study (NCDS) who were born in 1958, into the later part of the 'baby boomers' generation. They have been followed since birth and are age 63 at the time of the data collection. The second cohort is the 1970 British Cohort Study (BCS70) who were born in 1970, part of 'Generation X'. They have been followed since birth and are age 51 at the time

of data collection. The third cohort are members of Next Steps, who were born in 1989-1990, part of the generation known as 'Millennials'. They have been followed since adolescence and are age 31. The youngest cohort is the Millennium Cohort Study (MCS), born in 2000-2002, part of 'Generation Z'. They have been followed since birth and are aged 20 at the time of data collection.

The members of all these cohorts have taken part in a covid-19 survey (Brown et al., 2021). The covid survey was conducted in three waves. A first online survey (Wave 1) took place in May 2020, a second survey (Wave 2) in September – October 2020. Participants completed a third survey (Wave 3) in February/March 2021 via a combination of phone and web interviews. We utilise the data from the third wave of this survey, to look at the effects one year after the outbreak of the pandemic in the Britain.

Our analytical sample (N=10,892) is confined to survey participants who were employed in March 2020, and at the time of the third wave of the data collection have been living in England, Scotland, or Wales. In classifying household type, we use information regarding people living in the cohort member's household i.e., whether husband, wife or cohabiting partner are a member of the household and whether there are any children in the household to whom the survey participant considers themselves a parent. This is not always equivalent to their family status since not all cohort members live with their partner and/or children. Given that our sample only includes those who responded to the questions regarding their living situation, and that we further exclude lone fathers from the analyses by household types due to small sample, we exclude 148 observation.

Figure 1 shows the distribution of cohort members in our analytical sample by their household type, and highlights that the living situation is age-graded. Almost 50% of those in the oldest cohort (Age 63) live with their partner and no children. The majority of those in the second cohort (Age 51) live with a partner as well as children. The cohort members of the third cohort (Age 31) are relatively evenly distributed across household types. The youngest cohort members tend to live alone.

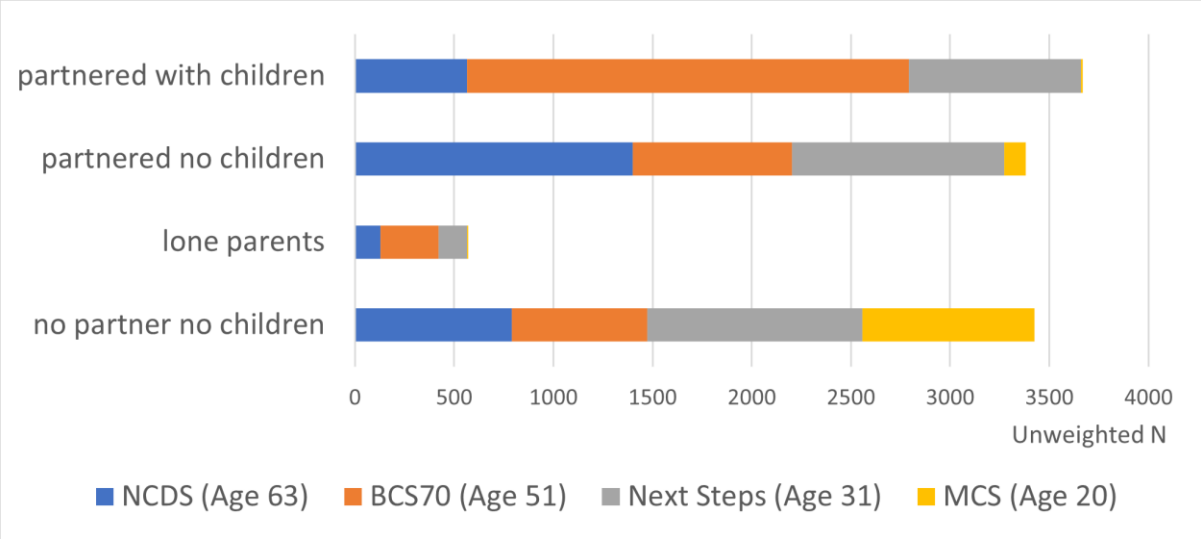

Figure 1: Distribution of cohort across household types

Since it is possible to account for partner's job characteristics only on the subset of participants who live with a partner, to test H2 we conduct additional analyses on this subsample (N=7,011). We then conduct further supplementary analysis on a subsample of those who live with both their partner and children (N=3,644) to see if the presence of children is related to gender gaps.

Outcomes:

We investigate four binary outcomes: three binary outcomes relate to employment participation, which include progressively more narrow definitions of employment, and furlough. Our first outcome indicates whether the respondent remained in employment. This indicator includes employees (furloughed or not), apprenticeships, those in voluntary work and the self-employed. Our second outcome is active paid work, which excludes those on paid or unpaid leave or furlough and those in unpaid work from the above definition. Our third outcome is an indicator for whether the respondent remains in the same job as the one he/she had prior to the pandemic, in March 2020. Finally, our last outcome is furlough status, an indicator for whether the respondent is on paid leave.

Table 1 shows the weighted proportion of the outcomes across all three analyses samples. Men are a little more likely than women to be in employment, especially among those with partners and children. The gender gap is wider when we focus on those who are in active work and those in the same job. Again, the gap is most pronounced among those with partners with children. By contrast, women are more likely than men to be on furlough.

Table 1: Weighted proportions of outcomes across three analyses samples

	All		Partnered		Partnered with children	
	Men	Women	Men	Women	Men	Women
Proportion remaining in employment	0.89	0.87	0.93	0.90	0.95	0.90
Proportion in active work	0.85	0.80	0.89	0.83	0.92	0.82
Proportion in the same job	0.76	0.72	0.82	0.75	0.85	0.76
Proportion furloughed	0.03	0.06	0.04	0.06	0.03	0.07
Unweighted N	4630	6262	3130	3881	1630	2014

Notes: proportions are based on weighted survey responses; Ns are unweighted

The distribution of outcomes across cohorts, shown in Appendix A, reveals that the members of the two middle cohorts, those age 51 and 31, are more likely to remain in employment (~96%), actively work (~91%) and remaining in the same job (~82%). These rates are the lowest and gender differences are the largest for the youngest cohort, pointing to the relatively disadvantaged position of the younger cohorts. The largest gender differences are observed in the proportion of people who continued to actively work in the youngest cohort. This proportion is 57% for men, while the comparable proportion of women is only 44%. However, the sample size for this cohort is also the smallest.

Estimation:

Our analyses are designed to examine whether covid-19 had a disproportionately negative impact on women compared to men and, if so, whether this was because women were over-represented in affected jobs (H1) or whether their jobs were less economically valuable, as compared to their partners' jobs, and given the scale of domestic responsibilities households adjusted labour supply in accordance with the efficient household hypothesis (H2).

We use a pooled sample of all four cohorts and estimate linear probability models. We restore sample representativeness by using combined weights which account for both survey design and non-response (for details on weights derivation please see Brown et al., 2021).

We firstly identify the presence and magnitude of gender gaps. To do this we include a female dummy in our regression models to estimate raw gender differences. We then consecutively add sets of covariates to the regression models and compare the coefficients of the female dummy variable to examine how these adjustments affects gender differences. These adjustments are:

- **Household adjustment**: this set of indicators is designed to reflect the household situation, and incorporates variables indicating the presence of spouse or cohabiting partner in the household and the presence of any children of whom the cohort member considered themselves a parent to.

- **Age adjustment**: as the effects are expected to be different across career stages (Akkermans, Richardson, & Kraimer, 2020), we subsequently adjust for age by including a variables for the cohort to which the member belongs to. In our analyses the age and cohort are equivalent.

- **Basic adjustment:** this set of indicators relates to the likelihood of being employed and includes: the country of current residence (England, Scotland, Wales), whether they live in London, their education level as captured by their highest qualification before the start of the pandemic (none, NVQ level 1 to 5), childhood social class (manual, non-manual), and the mode of the survey (web, telephone).

- **Job adjustment:** here we also control for the cohort member's job characteristics by including their Standard Occupational Classification (SOC) in March 2020 at 1 digit level (for categorisation see Appendix B), as well as a part-time dummy based on the hours worked in March 2020, identifying those who worked less than 30 hours per week. If the job characteristics account for a significant part of the gender gaps, we can consider this as evidence in support of H1 (occupational segregation hypothesis). The complete results from these regressions for all adjustment levels are shown in Appendix C.

To retain the same sample across the adjustment levels, we include missing dummies where the covariate categories are missing. These are mainly variables that have been collected in pre-pandemic sweeps, such as education and parental social class, as well as the occupation variables. Detailed missingness rates, together with the descriptive statistics, for all controls across men and women in the three samples are shown in Appendix B.

The second set of analyses investigate changes in the interaction between gender and household type. Here we initially include variables indicating household and gender interaction (women partnered with children; women partnered no children; women alone no children; women alone with children; men partnered with children; men partnered no children; men alone no children), Partnered men with children are considered as the reference category, given they tend to have privileged position in the labour market as they would have likely accumulated the labour market experience and they tend to experience lower or no child penalty to their wage (Joshi et al., 2019). We subsequently add the variables from "age", "basic" and "job" adjustment described above. The complete results from these regressions are shown in Appendix D.

The final set of analyses is designed to investigate the impact of partner's job, as well as the presence and the age of children in the household. If these characteristics account for the gender

differences, this can be considered as evidence with respect to H2 (efficient household hypothesis). As stated above, these analyses are conducted on the subset who live with a partner, and on a further subset living with a partner and children. In the partner adjustment we include partner's SOC at 1 digit level, with the same categories at the SOC of cohort member, with an additional category for those whose partners did not work in March 2020. In the children adjustment we include the number of children in the household as well as the age of the youngest child (5 or less; 6 to 11; 12 to 18; 19 or more). The complete results from these regressions are shown in Appendix E and F.

4. Results

Figure 2 shows raw and adjusted gender gaps (i.e., regression coefficients on the female dummy) for our four outcomes. Male, the reference category, is reflected by the black vertical line, while the dots represent female coefficients and the whiskers the associated 95% confidence intervals. The raw gaps are shown by the dark blue estimates, the grey estimates are adjusted for household characteristics, red are additionally adjusted for age, green also include the set of basic controls listed above and yellow also include cohort member's job characteristics.

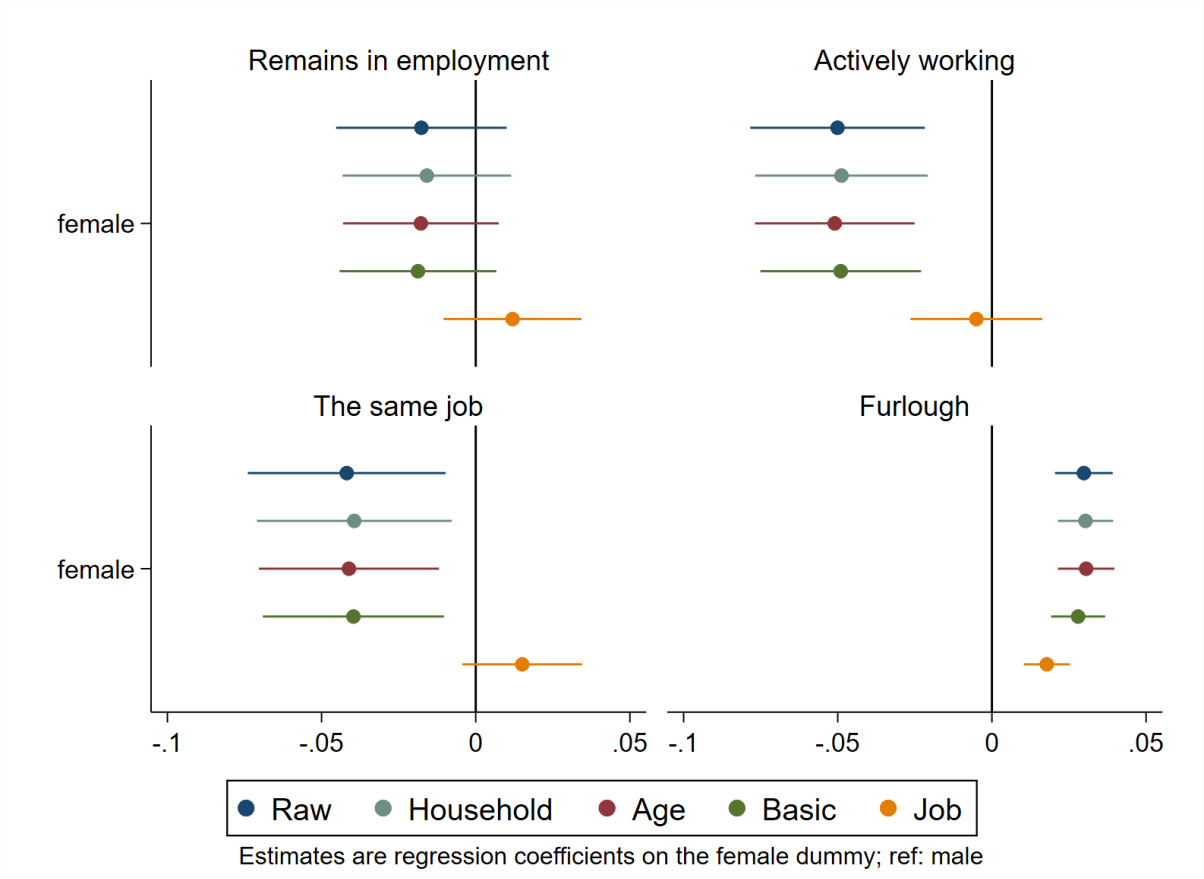

Figure 2: Gender gaps in the employment participation and furlough

In terms of raw gaps, as seen by the overlap between the black line and the female confidence intervals, we find no significant gender differences in terms of remaining in employment - our broadest definition of employment participation. However, women are ~5 percentage points less likely than men to remain in active paid work and 4 percentage points less likely to remain in the same job, as well as 3 percentage points more likely to be furloughed. The adjustment for household characteristics, age and other basic controls makes little difference to these estimates. However,

once we account for job characteristics the gaps in employment participation outcomes disappear. We interpret this as evidence in support of H1 (occupational segregation hypothesis), this adjustment reduces, but does not fully account for the gender difference in furlough rates, with women 1.7 percentage points more likely to be furloughed. In our sample, as shown in Appendix G, women are overrepresented in administrative and secretarial occupation (77%), caring, leisure and other service occupations (75%) and sales and customer service occupations (70%). However, men predominantly work in skilled trades occupations (86%) and process, plant and machine operatives (87%).

Figure 3 shows the gender and household gaps in the probability of remaining in employment. Here the reference category is partnered men with children. The raw gaps show that people in all other household types are less likely to remain in employment than partnered men with children. In the case of partnered women with children the raw differences are relatively small (5 percentage points) but persist even after the age and basic adjustment and disappear once job characteristics are accounted for, providing further evidence in support of H1. These findings are partially in line with Andrew et al. (2021) who also find significant differences in the rates of job loss and furlough between mothers and fathers, with mothers being 10 percentage points more likely to have stopped working for pay than fathers. However, they also find that controlling for job characteristics increases the gender gap in how likely individuals were to be in paid work during lockdown by between 2 and 7 percentage points. While their findings suggest that mothers' jobs may have been less structurally vulnerable to covid-related demand shocks than those of fathers, our evidence does not support this proposition. These differences could be related to the timing of data collection (they study the first lockdown, a couple of months into the pandemic crisis, while we focus on what happened one year after that), or the composition of the sample (they use a sample of parents of school-age children while we use four distinct one-year cohorts), or the different level of detail on job characteristics that exists in the two data sources (their data was collected online through a bespoke survey and contains less detail on the industry and occupation of pre-pandemic jobs than ours).

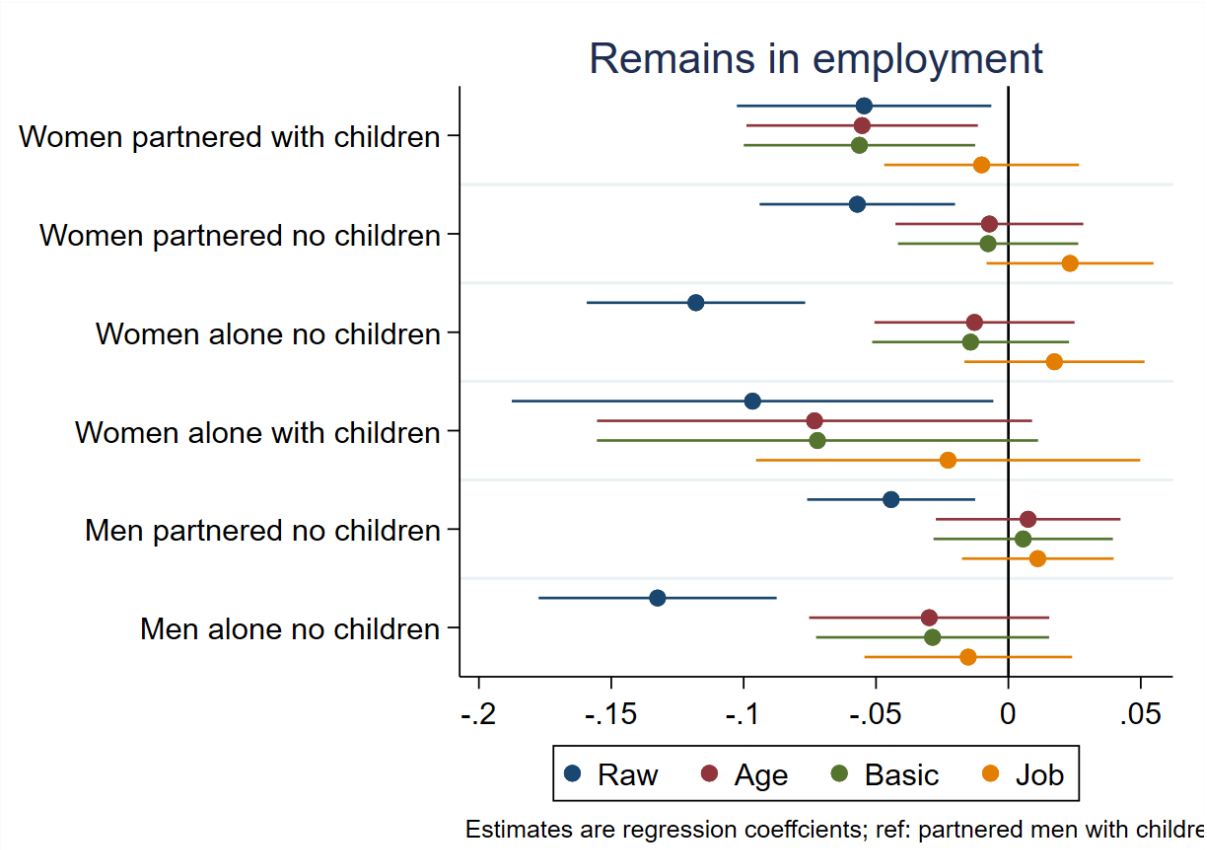

Figure 3: Gender and household gaps in probability of remaining in employment

The coefficients for those who do not live with partner or children are similar for men and women and are not significantly different from each other. The raw gaps for these groups and the largest in magnitude (11 percentage points for women and 13 for men), showing that those who do not live with children are much less likely to remain in employment than men with partners in children. The differences diminish and are no longer statistically significant controlling for cohort, which implies that the age of respondents matters. This is consistent with previous studies that show that younger people of both sexes were more likely to be adversely affected (see for example Cotofan et al., 2021). Basic and job adjustment make little difference once age is accounted for. Conversely to what H1 would suggest, these results indicate that for those who do not live with partner of children age is the main driver behind the differences.

Both men and women who are partnered but live with no children are significantly less likely than men with partners and children to remain in employment, with gaps estimated at 5.7 percentage points for women and 4.4 for men. Similarly in this case, once age is accounted for, the differences are no longer statistically significant as compared to partnered men with children. The basic adjustment makes little additional difference. Including job characteristics does not attenuate the differences further, but it does increase women's probability of remaining in employment more than it does for men.

Furthermore, we do not observe any significant gender difference in the probability of remaining in employment once pre-pandemic job characteristics are accounted for, irrespective of household type. This is important in distinguishing between the evidence for H1 and H2. If conditioning on job characteristics has led to a diminution of gender differences in couple households but not for those

who live with a partner, this could have been consistent with H2 implying that women's jobs are likely less-well paid or more likely to be part-time and therefore provided less contribution towards the household income. Instead, we find the effects of including job characteristics are common across all household types, irrespective of whether partner and children lived in the same household. This is more consistent with what might be expected under H1.

Lone mothers have a lower probability of remaining employed than men with partners and children. This raw differential shifts only marginally with the inclusion of age and basic controls, but the small sample size means the confidence intervals around the point estimates are large.

Figure 4 shows the differences between the same family types as described above, but for those who are in active paid work (LHS) and those who reminded in the same job (RHS). The estimates for these two outcomes follow similar patterns. In the case of partnered women with children the raw differences are statistically significant and broadly similar across the two outcomes, estimated at ~10 percentage points. The age and basic adjustments do not attenuate these differences by much. However, once the job characteristics are accounted for the differences in terms of propensity to retain the same job disappear, as expected under H1. However, women are still slightly less likely to be in active paid work than otherwise comparable men.

For couples with no children and those who do not live with either partner or children, the raw differences are mostly attenuated by age, making the age-adjusted estimates either not different or borderline different from partnered men with children. Basic adjustment does not make much difference to these estimates, but all gender differences become statistically non-significant when accounting for job characteristics, irrespective of household type. These patterns are broadly similar to those for remaining in employment. Here again the job adjustment makes a bigger difference for women than it does for men.

Figure 5 shows the probability of being furloughed across the household types. What is the most striking is that women appear to be more likely to be furloughed than men when considering the raw estimates, irrespective of household type, and the differences compared to the men with children and partners remain statistically significant even controlling for age and basic controls.

Women with children and partners are the most likely to be furloughed, and they remain statistically more likely to be furloughed even when accounting for their pre-pandemic job characteristics, with the estimated difference of 2 percentage point. This implies that, for those who live with partner and children, women are more likely to be furloughed than otherwise comparable men, regardless of the job they held prior to the pandemic. Although job adjustment reduces gender differences, they are not fully attenuated implying H1 does not provide a full explanation. When we control for the job characteristics, women in all household types still are more likely to be furloughed than partnered men with children, but the difference is on the borders of statistical significance.

Men who do not live with partner or children appear to be the only group that is less likely to be furloughed than men with children. Although the raw differences are not statistically significant, they increase with subsequent adjustment and appear significant once job characteristics are accounted for, indicating that this group is less likely to be furloughed than otherwise comparable men who live with partner and children. We do not find any significant differences amongst men who live with a partner.

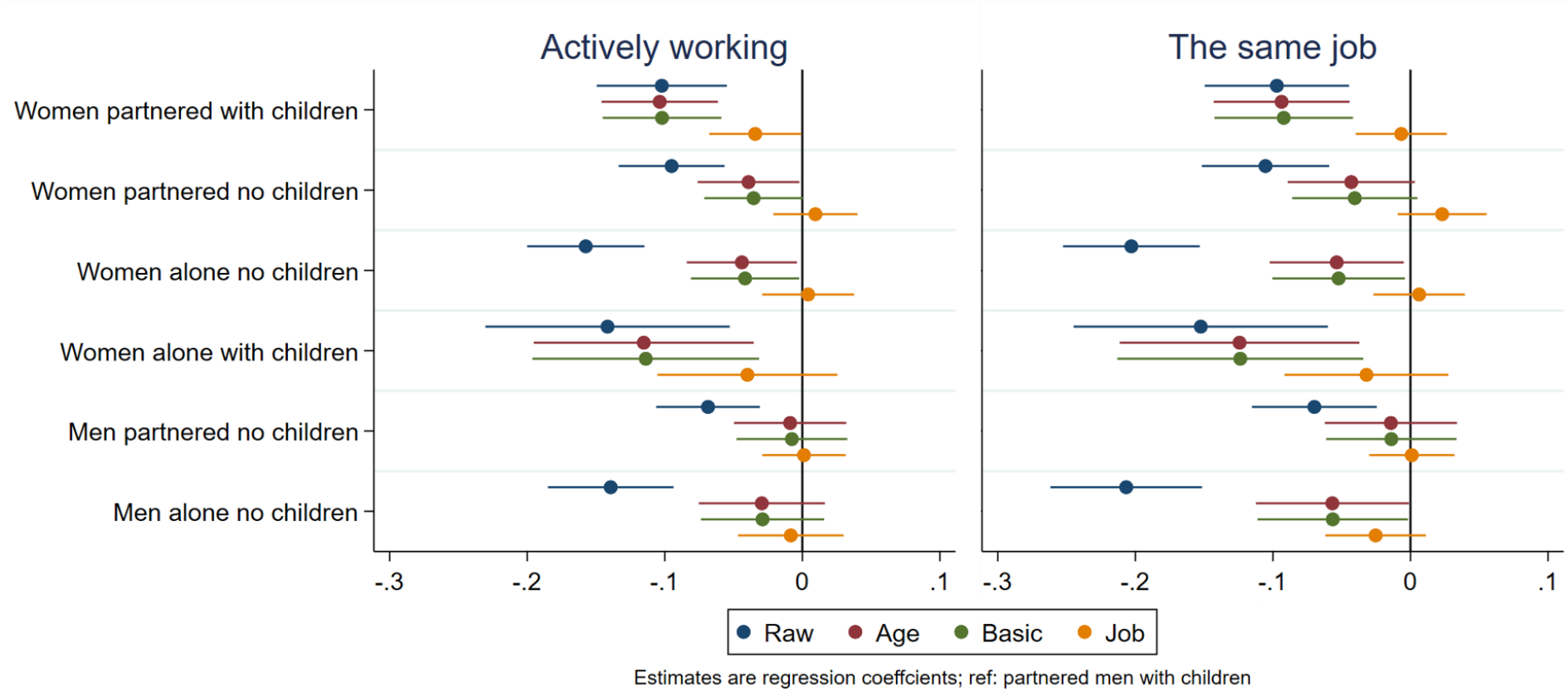

Figure 4: Gender and household gaps in probability of being active in paid work and remaining in the same job

Given that we find significant differences between men and women when they are partnered and have children regardless of their job characteristics, we conduct further analyses to test H2 (efficient household hypothesis) for two subgroups: those who have a partner and those have a partner and children. These are designed to test whether taking into consideration the job characteristics of their partner and the scale of domestic responsibilities attenuates gender differences.

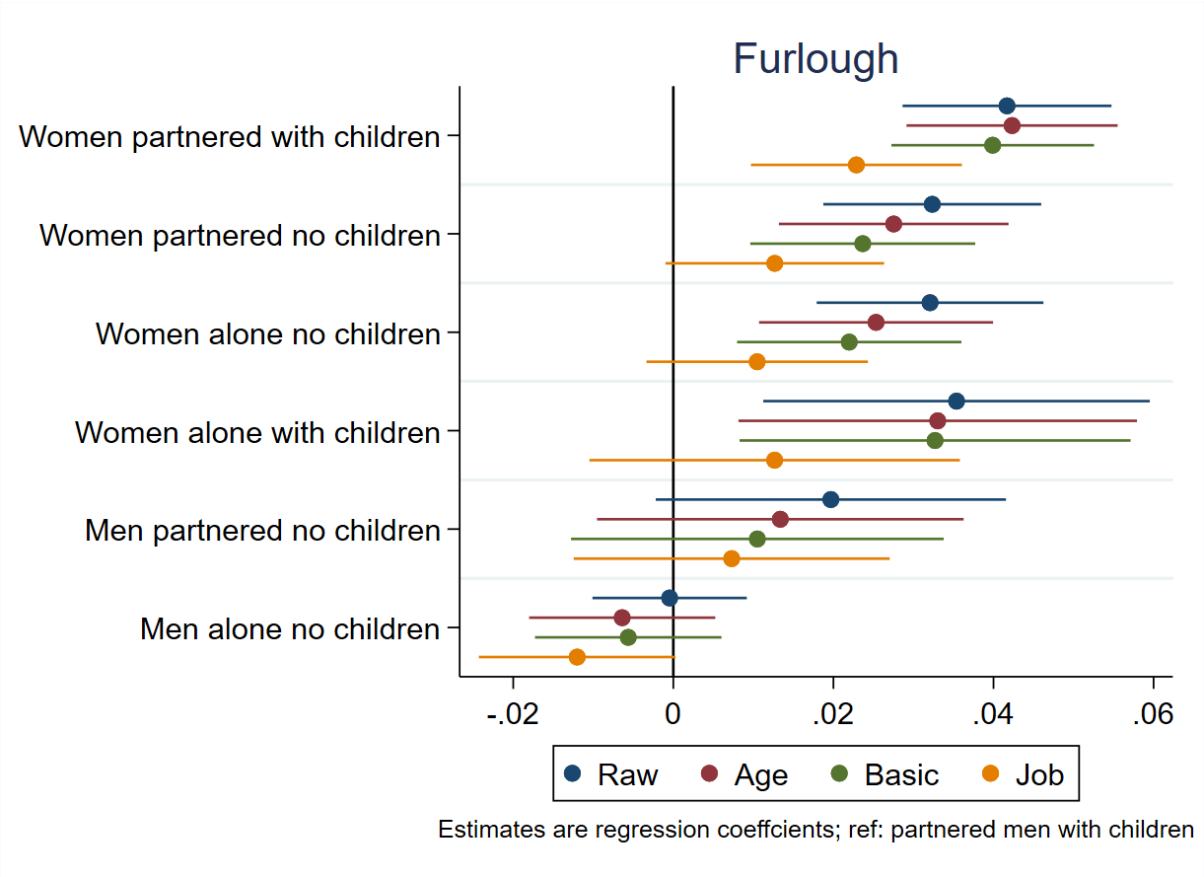

Figure 5: Gender and household gaps in the probability of being furloughed

The results for respondents with partners are shown in Figure 6. With this subsample we see similar patterns to those observed in the previous figures: job adjustment narrows gender differences between women and men who are partnered with children, but significant gaps in the rates of active, paid work and the furlough remain. Furthermore, age adjustment appears more relevant for those with no children. We find that adjusting for partner's characteristics makes little difference to previous estimates: partnered women with children are still significantly less likely to be actively working and more likely to be furloughed. However, for women with partner and no children these gaps are not significant once we account for their job characteristics. This provides little support for the efficient household hypothesis - H2.

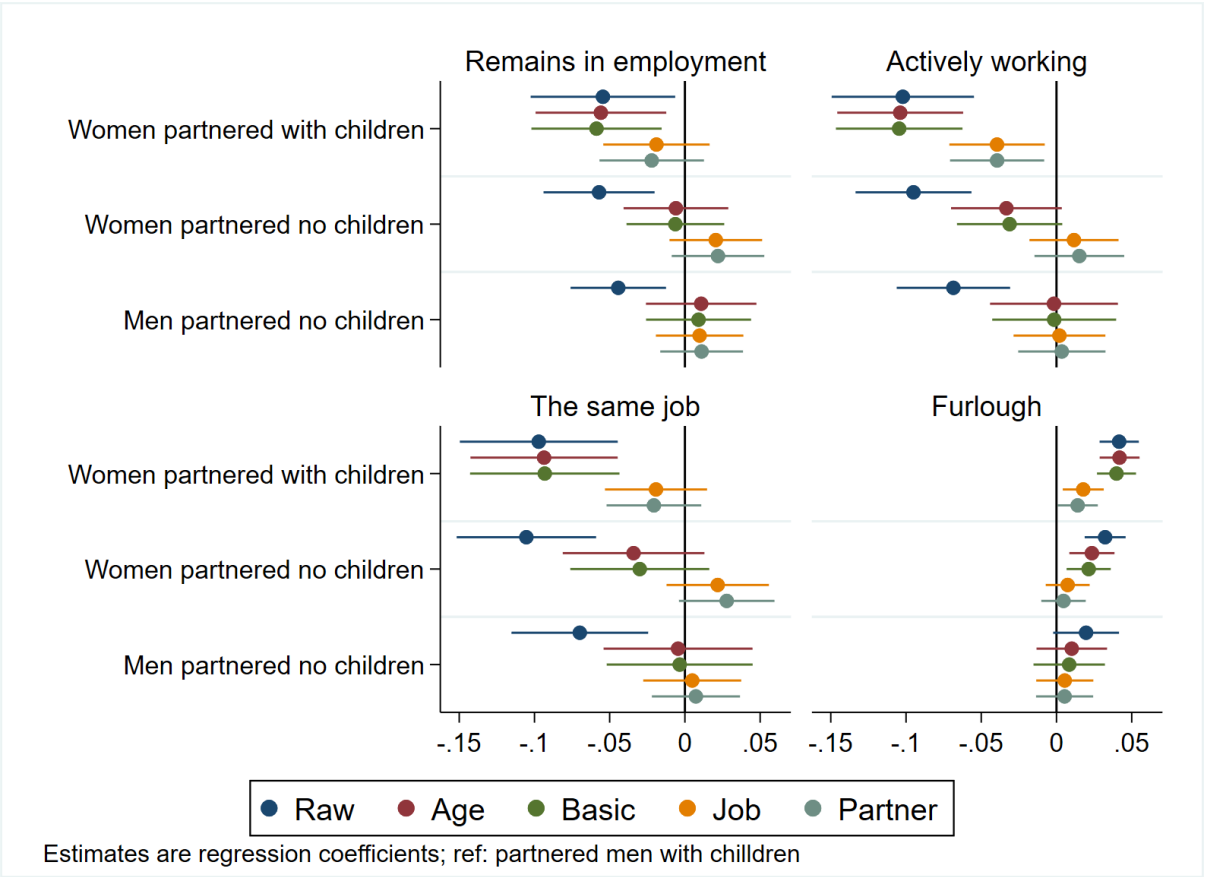

Figure 6: Gender and household gaps in all outcomes once taking the partner's job characteristic into consideration

To test whether these differences are driven by the presence of children and whether age of children matters, we conduct further analyses on the subset of respondents who have children as well as a partner. These are shown in Figure 7 and reveal that even after accounting for partner's job, the number of children in the household and the age of youngest child, we still find statistically significant differences between partnered men and women in terms of their propensity to be in active paid work and furloughed. This again provides little support for H2. The residual gap that remains after all our adjustment could be related to social norms, preferences, and discrimination, which is discussed in more detail in the following section.

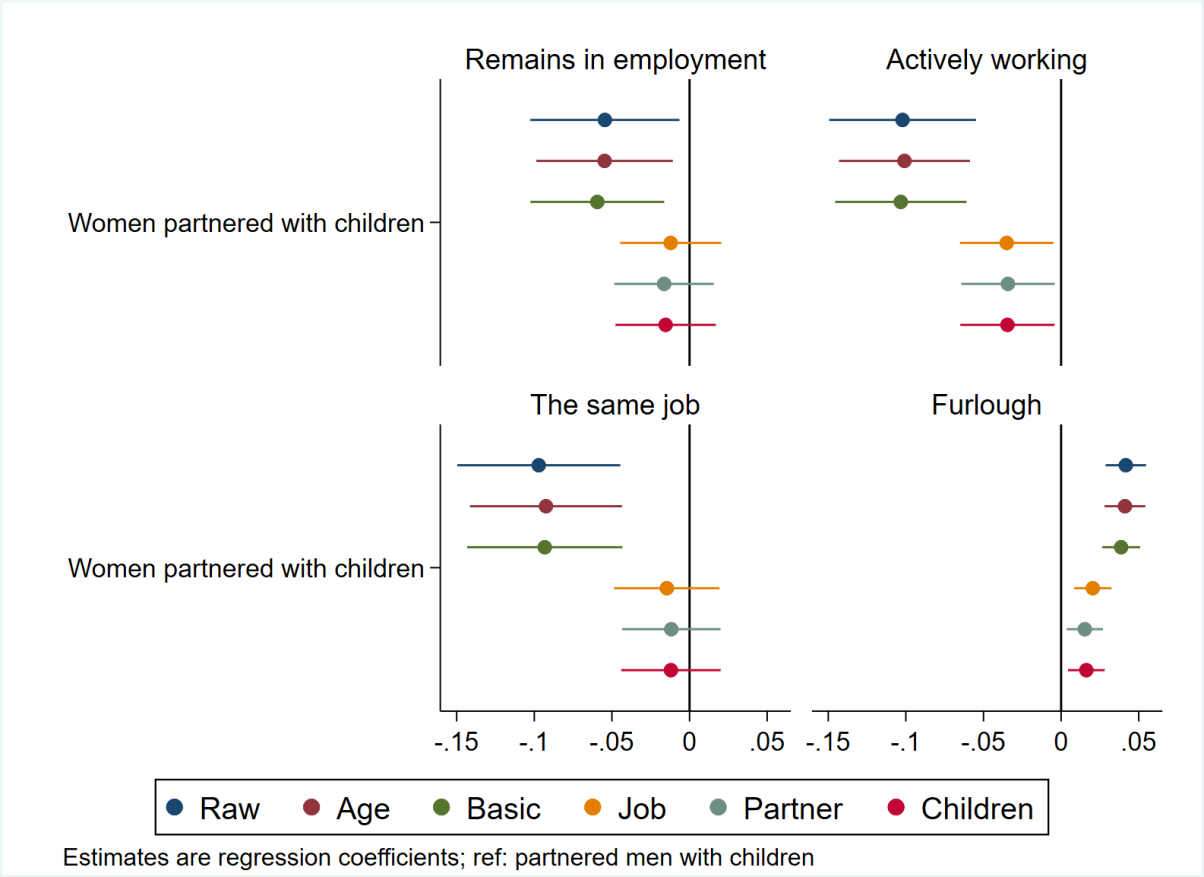

Figure 7: Gender and household gaps in all outcomes once talking the partner's job characteristic and the age of children into consideration

5. Discussion and concluding remarks

In this paper we examine whether the covid-19 pandemic disproportionately affected women's employment relative to men's in Britain one year after the start of the pandemic. We consider four different employment outcomes and consider both overall gender differences and differences by gender and household type. Unlike much of the previous research we look at outcomes one year on from the beginning of the pandemic, once the economy has partially recovered. In line with previous findings (Alon et al., 2021; Andrew et al., 2021; Collins et al., 2020), the results reveal that women were more likely to be adversely affected then men, especially if they live with partners and children. However, the gaps are much more modest than in previous studies. We also extend the analyses to types of households other than couples, showing that the gender gaps to large extent explained by age, for those who live with no partner or children.

We find some support for the hypothesis that women have been affected to a greater extent because they are over-represented in jobs disproportionately affected by covid-19 pandemic (H1). The initial indication of this can be seen in Figure 2, as the gender differences in the probability of employment are attenuated when we account for the job characteristics (occupation and part-time status pre-covid). This is further confirmed in Figures 3 and 4, where we consider gender and household type differences. Once we adjust for job characteristics partnered women with children are equally likely to remain employed as their male counterparts. We observe these effects irrespective of household type, which implies that reasons behind the differences are more likely to

be related to the characteristics of the jobs typically performed by, rather than their relative labour market position, as compared to their partners. Additionally, these results show that adjusting for job characteristics attenuates the differences by more for women than it does for men. Furthermore, as shown in Figure 5, job characteristics attenuate the gap in the probability of being furloughed.

We find little support for the hypothesis that women have been affected to a greater extent because of their labour market disadvantage as compared to their partners and the scale of domestic responsibilities (H2). Our initial analyses of gender differences, shown in Figure 2, show that adjusting for the presence of a partner in the household makes little differences to gender gaps. Furthermore, even accounting for the partners' job characteristics explicitly, as shown in Figures 6 and 7, and for the age of the youngest child, as shown in Figure 7, makes little difference to previous estimates. This is in line with previous studies that suggest that choices families made were not entirely driven by the aim of prioritising the work of the partner who earned more (Andrew et.al., 2021).

Having accounted for the participant's and their partner's job, as well as the presence and age of children we still find significant differences between men and women in terms of their propensity to be in active paid work and furloughed for couples with children. In these households, women are less likely to remain in active paid work and more likely to be furloughed regardless of their pre-pandemic job, the job of their partner and the number of children and age of youngest child. This residual gap is likely related to unobserved characteristics, such as social norms, preferences, or discrimination.

Social norms reflect the expectation that looking after children and housework is women's responsibility and they are better suited to it than men. Women may face pressure to look after the children, despite their earnings potential, and to navigate their careers in way that allows them to combine both work and family roles to some degree. Similar pressure may be faced by men in terms of their breadwinner status. In recent years women overtook men in educational attainment (Bryson, Joshi, Wielgoszewska, & Wilkinson, 2020) and increased their participation in the labour market. While these societal changes are challenging Becker's original idea about efficient household allocation, social norms continue to play an important part. Evidence suggests that women's contribution to household income increases with their relative education (Van Bavel & Klesment, 2017) and that high-earning women, even though they often still did more housework than their male partners, reported a significantly less traditional division of domestic labour than did other women (Lyonette & Crompton, 2015). Social expectations with respect to women's role are likely to be higher for couples with children and balancing the demands of paid work with childcare is likely to be more challenging for mothers in more demanding jobs. For example, Benzeval et al. (2020) show that highly educated mothers spend 6 hours more doing childcare and home schooling per week than mothers whose highest qualification is at GCSE level or lower, which implies that mothers with higher education may have prioritised education of their children during the period of school closures.

Alternatively, the residual gap may reflect preference theory (Hakim, 2000), which posits that women's preferences are a central determinant of life choices, in particular the choice between children and family life or employment. For example, women may have chosen to be furloughed because, facing the choice between juggling home-schooling and paid work or the conditions offered

under the furlough scheme (i.e., not working while still receiving 80% of their pay) they may simply prefer the latter. Although we have no indication of preferences in our data, there is a debate in the literature related to whether lower labour market participation by women as compared to men, even in highly educated groups, reflects preferences of women to undertake the greater share of housework, or whether women are conforming to socially constructed gender roles. For example, Bertrand (2020) shows that in countries where majority of people agree with the statement that "when jobs are scarce, men have more of a right to a job than women", female labour market participation rates are lower. She argues that this could be because the gender identity norms have been fully internalized and directly shape one's preferences, or because of concerns about the reputational consequences of deviating from the prescribed behaviour. Countering such expectations may be costly and may even inhibit women when deciding how much to invest in education and careers (Adda, Dustmann, & Stevens, 2017).

Employer discrimination is another possible explanation of the residual gap. For example, we may consider the possibility that women, rather than volunteering to be furloughed, were forced to do so by their employers at higher rates than men. These decisions could have been grounded in economic and profit making reasons, but they could also have been based on inferred statistical characteristics of mothers, stereotypes, or simply a dislike towards women. Charles, Guryan, and Pan (2018), in their study of the effects of sexism on American women, show that sexism lowers womans' wages, labour force participation and ages of marriage and childbearing. Although discrimination based on gender is illegal in the UK, covid-19 pandemic presented unprecedented setting. Given there were few established procedures to challenge unfair workplace culture, these setting may have reinforced existing prejudices and fixed ideas about gender roles that some hold.

Following the covid-19 pandemic, the UK observed a strong contraction in labour demand with entire sectors of the economy closed by decree and workers sent home. These changes affected women to a greater extent. Since women's labour supply is generally more elastic than that of men, their lowered earnings prospects after an unemployment spell are more likely to result in a persistent reduction in labour supply (Alon et al., 2021). These effects may be long lasting and jeopardise women's position in the labour market, leading to reinforcement of gender inequalities or even reversal of the progress towards gender equality. While these sectors are expected to eventually fully re-open, their level of activity may take a long time to return to pre-pandemic levels and those who interrupted their careers or taken a step back may find it challenging to return. Workers in these sectors, as well as others who cannot work from home, may have lost skills, experience and promotion opportunities and be at especially elevated risk of job-loss, once furlough scheme ends, and earnings stagnation or contraction upon return.

Avila and Mattozzi (2020) highlight that inclusive and gender-responsive labour market policies should be prioritized to ensure that the disadvantaged groups do not fall further behind. However, to date, the UK government has largely failed to consider gender in its covid-19 response, despite the many and varied differential impacts of policy interventions on women and men (C. Wenham & Herten-Crabb, 2021). Latest briefing by Close the Gap (2021) shows that, a year into the pandemic, many women do not believe their needs have been met by the UK governments' responses to the pandemic. This feeling is even more widespread among women who already were experiencing disadvantage and discrimination, potentially exacerbating social inequalities. Future policy initiatives should ensure that those who were unable to work during the pandemic are reinstated into

employment as soon as circumstances allow them to do so safely. With increased prevalence of remote working, decreasing stigma associated with working from home, and more and more business moving their operations online, these policy initiatives ought to consider changing realities of the world of work.

In particular, the policies should focus on the most vulnerable groups. Our research, in line with other recent studies, shows that lockdown had more adverse effects on women and younger adults. Many younger people have lost potential opportunities for employment and skills development, while many women have experienced the double burden of navigating paid work and childcare. Future policy initiatives should be inclusive and mindful of the scarring effects that economic downturns have on these groups and aim at ensuring that the divide does not increase further. These long-term, forward-planning policies should also focus on the groups that are at higher risks of "falling through the cracks".

References

Adda, J., Dustmann, C., & Stevens, K. (2017). *The career costs of children*. Journal of Political Economy, 125(2), 293-337.

Akkermans, J., Richardson, J., & Kraimer, M. (2020). *The Covid-19 crisis as a career shock: Implications for careers and vocational behavior*. Journal of Vocational Behavior, 119.

Albanesi, S., & Kim, J. (2021). *Effects of the COVID-19 Recession on the US Labor Market: Occupation, Family, and Gender*. Journal of Economic perspectives, 35(3), 3-24.

Alon, T., Coskun, S., Doepke, M., Koll, D., & Tertilt, M. (2021). *From Mancession to Shecession: Women's Employment in Regular and Pandemic Recessions*. Retrieved from https://www.nber.org/papers/w28632

Andrew, A., Cattan, S., Costa Dias, M., Farquharson, C., Kraftman, L., Krutikova, S., . . . Sevilla, A. (2021). *The gendered division of paid and domestic work under lockdown*.

Avila, Z., & Mattozzi, G. (2020). *COVID-19: public employment services and labour market policy responses*. Retrieved from https://www.ilo.org/emppolicy/areas/covid/WCMS_753404/lang--en/index.htm

Becker, G. S. (1965). *A Theory of the Allocation of Time*. The economic journal, 75(299), 493-517.

Bell, B. D., Bloom, N., & Blundell, J. (2021). *This Time is Not so Different: Income Dynamics During the COVID-19 Recession*. Retrieved from https://www.nber.org/papers/w28871

Benzeval, M., Borkowska, M., Burton, J., Crossley, T. F., Fumagalli, L., Jäckle, A., . . . Read, B. (2020). *understanding Society COVID-19 Survey April briefing note: home schooling*. Retrieved from https://www.understandingsociety.ac.uk/research/publications/526136

Bertrand, M. (2020). *Gender in the twenty-first century*. Paper presented at the AEA Papers and Proceedings. Retrieved from https://pubs.aeaweb.org/doi/pdfplus/10.1257/pandp.20201126

Blundell, R., Costa Dias, M., Joyce, R., & Xu, X. (2020). *COVID-19 and Inequalities*. Fiscal Studies, 41(2), 291-319.

Boniol, M., McIsaac, M., Xu, L., Wuliji, T., Diallo, K., & Campbell, J. (2019). *Gender equity in the health workforce: analysis of 104 countries*. Retrieved from https://apps.who.int/iris/handle/10665/311314

Brewer, M. (2021). *After Covid-19: the lessons for the UK's labour market, inequality and the welfare system*. Paper presented at the The Work, Pensions and Labour Economics Study Group, The Work, Pensions and Labour Economics Study Group. https://www.sheffield.ac.uk/economics/events/work-pensions

Brown, M., Goodman, A., Peters, A., Ploubidis, G., Aida, S., Silverwood, R., & Smith, K. (2021). *COVID-19 Survey in Five National Longitudinal Studies: Waves 1, 2 and 3*: User Guide (Version 3). Retrieved from https://cls.ucl.ac.uk/wp-content/uploads/2017/02/UCL-Cohorts-COVID-19-Survey-user-guide.pdf

Bryson, A., Joshi, H., Wielgoszewska, B., & Wilkinson, D. (2020). *A short history of the gender wage gap in Britain*. Oxford Review of Economic Policy, 36(4), 836-854.

Charles, K. K., Guryan, J., & Pan, J. (2018). *The effects of sexism on American women: The role of norms vs. discrimination*. Retrieved from https://www.nber.org/papers/w24904

Close the Gap, Engender, Fawcett Society, Northern Ireland Women's Budget Group, Women's Budget Group, & Wales, W. s. E. N. (2021). *One year on: Women are less likely than men to feel the Government's response to Covid-19 has met their needs*. https://wbg.org.uk/wp-content/uploads/2021/03/Round-2-general-brief_FINAL-COPY.pdf

Collins, C., Landivar, L. C., Ruppanner, L., & Scarborough, W. J. (2020). *COVID-19 and the gender gap in work hours*. Gender, Work & Organization, 28, pp.101-112.

Costa Dias, M., Joyce, R., & Parodi, F. (2018). *The gender pay gap in the UK: children and experience in work*. Oxford Review of Economic Policy, 36(4), 855–881

Cotofan, M., De Neve, J.-E., Golin, M., Kaats, M., & Ward, G. (2021). *Work and Well-being during COVID-19: Impact, Inequalities, Resilience, and the Future of Work*. World Happiness Report 2021, 153.

Furman, J., Kearney, M. S., & Powell, W. (2021). *The Role of Childcare Challenges in the US Jobs Market Recovery During the COVID-19 Pandemic*. Retrieved from https://www.nber.org/papers/w28934

Goldin, C. (2014). *A grand gender convergence: Its last chapter*. American Economic Review, 104(4), 1091-1119.

Hakim, C. (2000). *Work-lifestyle choices in the 21st century: Preference theory*: OUp Oxford.

Hatayama, M., Viollaz, M., & Winkler, H. (2020). *Jobs' amenability to working from home: Evidence from skills surveys for 53 countries.* World Bank Policy Research Working Paper(9241).

Hertz, R., Mattes, J., & Shook, A. (2020). *When paid work invades the family: Single mothers in the COVID-19 pandemic*. Journal of Family Issues, 0192513X20961420.

Hoynes, H., Miller, D. L., & Schaller, J. (2012). *Who suffers during recessions?* Journal of Economic perspectives, 26(3), 27-48.

Hupkau, C., & Petrongolo, B. (2020). *Work, care and gender during the Covid-19 crisis*. Fiscal Studies, 41(3), 623-651.

Joshi, H., Bryson, A., Wilkinson, D., & Ward, K. (2019). *The gender gap in wages over the life course: Evidence from a British cohort born in 1958.* Gender, Work & Organization, 28(1), 397-415

Lyonette, C., & Crompton, R. (2015). *Sharing the load? Partners' relative earnings and the division of domestic labour*. Work, Employment and Society, 29(1), 23-40.

Madgavkar, A., White, O., Krishnan, M., Mahajan, D., & Azcue, X. (2020). *COVID-19 and gender equality: Countering the regressive effects*. McKinsey Global Institute. URL: www. mckinsey. com/featured-insights/future-of-work/covid-19-and-gender-equality-countering-the-regressive-effects (Haettu 29.9. 2020).

Preston, J. A. (1999). *Occupational gender segregation trends and explanations*. The Quarterly Review of Economics and Finance, 39(5), 611-624.

Qian, Y., & Hu, Y. (2021). *Couples' Changing Work Patterns in the United Kingdom and the United States during the COVID-19 Pandemic*. Gender, Work & Organization., 28(S2), 535-553

Şandor, A. (2021). *What the first COVID-19 lockdown meant for people in insecure, poor-quality work.* Retrieved from https://michaelharrison.org.uk/wp-content/uploads/2021/04/What-the-first-covid-19-lockdown-meant-for-people-in-insecure-poor-quality-work.pdf

Sevilla, A., & Smith, S. (2020). *Baby steps: the gender division of childcare during the COVID-19 pandemic.* Oxford Review of Economic Policy, 36(1), 169-186.

University College London, UCL Institute of Education, Centre for Longitudinal Studies. (2021). COVID-19 Survey in Five National Longitudinal Cohort Studies: Millennium Cohort Study, Next Steps, 1970 British Cohort Study and 1958 National Child Development Study, 2020-2021. [data collection]. 3rd Edition. UK Data Service. SN: 8658, http://doi.org/10.5255/UKDA-SN-8658-3

Van Bavel, J., & Klesment, M. (2017). *Educational pairings, motherhood, and women's relative earnings in Europe*. Demography, 54(6), 2331-2349.

Wenham, A., & Şandor, A. (2021). *People in low-paid, insecure work faced a rising tide of employment uncertainty in 2020*. Retrieved from: https://www.jrf.org.uk/report/people-low-paid-insecure-work-faced-rising-tide-employment-uncertainty-2020

Wenham, C., & Herten-Crabb, A. (2021). *Why we need a gender advisor on SAGE*. LSE Public Policy Review, 1(4).

Wielgoszewska, B., Green, F., & Goodman, A. (2020). *Finances and employment during lockdown: Initial findings from the COVID-19 Survey in Five National Longitudinal Studies*. Retrieved from https://cls.ucl.ac.uk/wp-content/uploads/2017/02/Finances-and-employment-during-lockdown-%E2%80%93-initial-findings-from-COVID-19-survey.pdf

Zhou, M., Hertog, E., Kolpashnikova, K., & Kan, M.-Y. (2020). *Gender inequalities: Changes in income, time use and well-being before and during the UK COVID-19 lockdown*. Retrieved from https://osf.io/preprints/socarxiv/u8ytc/