

## **Potential impact of childcare reform: Draft analysis of the GDP impacts from greater numbers of women in employment**

This note sets out two different methodologies to help understand the potential impact of childcare reform by looking at the economic benefits of a greater number of mothers in work.

### **Policy recommendation**

Childcare in the UK is among the most expensive in the world, and yet the system is not working for parents, children, or the early years workforce.

Childcare costs are often a prohibitive barrier which prevent parents from accessing employment and stops parents increasing their hours. If the UK is serious about growth, we cannot afford to lose parents from the labour market, particularly in a context of labour market shortages and a cost-of-living crisis.

The childcare reform recommended by the CBI includes:

- **Increase funding to the existing system** to ensure providers are receiving funding that reflects the true cost of service provision to reduce the costs for parents and allow providers to deliver a high-quality service; and,
- **Extend existing provision for 3- and 4-year-olds to all 1- and 2-year-olds**, considering the differing needs of children of different ages. Bridging the gap in existing provision is vital for ensuring parents are supported to remain in work.

This note covers the impact of these policies on maternal employment.

### **Summary of impact**

Using GVA per capita estimates, CBI analysis suggests that the UK's GDP could be increased by up to £290 million for every 10,000 mothers that return to employment on their desired hours. Our analysis suggests that full provision of childcare could bring back 60,000 mothers with children aged 1 to 4 into the workforce, resulting in a GDP uplift of £1.7 billion, boosting female employment by 0.6% and increasing earnings by £820 million.

Based on CBI's dynamic modelling (using Oxford Economics' General Economic Model), a permanent increase in employment of 60,000 would increase GDP growth by 0.04 percentage points in 2023 and 0.05 in 2024. In cumulative terms, this would boost GDP by up to £4.9 billion and increase Government tax revenues by up to £9.6 billion by 2027.

These estimates do not include the potential impact of a greater number of hours worked by mothers already in work. These estimates are also based on elasticities for out-of-work mothers at a point in time. Should policy change, the return-to-work likelihood would be expected to be greater for mothers in employment that reach the end of their parental leave than it is under the current policy. Overall, these estimates are therefore likely to underestimate the full impact of the policy and look only at the extensive margin.

## Key statistics from static modelling

Implementing CBI's childcare reforms could result in 60,000 mothers with children aged 1 to 4 entering employment at their desired level of hours, defined as 21.3. The impact of this would be:

GDP, £bn	% of GDP	Female Employment	Total Employment	Earnings, £m
+£1.7	+0.09%	+0.55%	+0.27%	+£820

In stylized terms, this means that for every 10,000 mothers that return to work on their *desired hours* (see methodology for definition) of work from sufficient provision of childcare, the UK economy would experience an expected GDP uplift of £290 million - equivalent to 0.01% of GDP.

However, these estimates are sensitive to assumptions around the hours worked on return. Flexing these assumptions, for every 10,000 mothers that return to work on:

- *Full-time employment* from sufficient provision of childcare, the UK economy would experience an expected GDP uplift of £670 million – equivalent to 0.03% of GDP.
- *Average part-time employment* from sufficient provision of childcare, the UK economy would experience an expected GDP uplift of £270 million - equivalent to 0.01% of GDP.

These figures are based on analysis incorporating a disaggregated GVA proxy accounting for male/female age bracket full-time/part-time median salaries conducted in March 2023.

## Dynamic modelling of two return-to-employment scenarios

The CBI's dynamic modelling (using Oxford Economics' Global Economic Model) has estimated two time-contingent scenarios of mothers returning to work:

1. All mothers return to work within a year of policy implementation; and
2. All mothers return to work within three years of policy implementation.

In both cases, the share of mothers returning to work is a steady flow per quarter from 2023 Q2 up to the expected 60,000.

This model provides a dynamic estimate of the UK economy from a boost in permanent employment inclusive of spillover effects into other aspects of the economy. This should not be thought of as additive to the GVA per capita analysis, rather complementary. It provides estimates of the aggregate cumulative impact of the boost to employment on GDP, GDP growth and gross Government tax revenues raised over time:

Scenario	GDP Impact, 2023, £bn	GDP Impact, 2027, £bn	Growth impact, 2023, ppts	Growth impact, 2024, ppts	Gross tax revenue impact, 2023, £bn	Gross tax revenue impact, 2027, £bn
<b>1</b>	£0.85	£4.89	+0.04	+0.05	£0.87	£9.56
<b>2</b>	£0.29	£4.39	+0.01	+0.03	£0.29	£7.74

Thus, a faster rollout of the policy provides a greater GDP and Government tax revenue impact in the short-term.

### **Key assumptions**

The following key assumptions apply to both modelling exercises:

- Mothers return to their desired hours of work of 21.3 hours per week; and,
- Cost of childcare is fully provided by the Government and, at the desired hours of work, is provided for 52 weeks of the year.

The following key assumptions apply to the static modelling exercise only, in addition to those listed above:

- Mothers that return to work do not face a loss of productivity and are assumed to be as productive as the age-equivalent female workers that did not leave the labour market;
- Gender and age median pay differences are a good proxy for the variations in GVA per capita by gender and age; and,
- Use of 2019 GVA per capita avoids anomalies created by the pandemic, subsequent lockdowns, and employment distortions from furlough.

The following assumptions apply to the dynamic modelling exercise, in addition to those listed above:

- The policy is assumed to be implemented from Q2 2023, although in practice this would likely take significantly longer; and,
- The share of mothers returning to work is a steady flow per quarter from 2023 Q2 up to the expected 60,000 under the two scenarios.

Note that these assumptions are only those specific to this analysis and do not cover assumptions relating to Oxford Economics' Global Economic Model.

### **Detailed methodology**

The estimates for the potential GDP uplift from workers returning to employment were produced by undertaking the five stages of analysis set out below:

1. Developing assumptions on the work patterns of mothers returning to work;
2. Estimating the number of mothers likely to return to work;
3. Estimating the static impact of mothers returning to work on GDP, accounting for age, gender, and work pattern differences in the labour market;
4. Producing a complementary dynamic estimate of the employment uplift on the economy.

#### *Stage 1: Developing assumptions on the work patterns of mothers returning to work*

The maximum case assumes all mothers who left work due to insufficient childcare return to work full-time, which has a significant economic impact.

However, this may not be completely realistic – mothers may return part-time. Women in the UK that work part-time work on average 19.5 hours per week (53% of the total UK average hours per person per week worked). Using the ASHE data proxy, we know that mothers in the 30-39 age bracket working part-time have an average GVA of £27,262 and work on average 20.2 hours per week.

In 2021, the Centre for Progressive Policy ran a representative survey with a sample of 2,209 women with children under the age of 16. This included questions on the estimated numbers of hours mothers would work should suitable childcare be available:

- Q16: *You said in the past that lack of suitable childcare has negatively impacted your ability to work. Had you had suitable childcare, how many additional hours per week would you have liked to have worked, either through taking on a new job or in addition to any you were already working.*
- Base: All respondents who have ever struggled to find suitable childcare in the past which has negatively impacted their ability to work.
- Answers: Hours split by working status.

They estimate that mothers out of work would work an additional 21.3 hours per week if childcare was sufficient. Mothers returning to work on these desired hours would then have a median salary of £13,553 and a GVA per capita of £28,746.

#### *Stage 2: Estimating the number of mothers likely to return to work*

To robustly estimate the impact of the childcare policy, a figure of expected numbers returning to employment needs to be established. This was done in a three-step process:

- A. *Estimating the number of mothers with children aged 1-4 that are economically inactive;*
- B. *Estimating the effective change in disposable income from the provision of childcare; and*
- C. *Estimating the return rate and the volume of mothers likely to return to employment from the provision of childcare.*

The need to estimate the effective change in disposable income is driven by the external elasticities available, more detail on the elasticities used is set out in section C.

#### *A. Estimating the number of mothers with children aged 1 to 4 that are economically inactive*

The estimate of the total number of mothers with children aged 1 to 4 that are economically inactive, we had to first estimate the number of mothers in the following sub-populations:

- Economically inactive mothers in a couple with a child aged 1-2;
- Economically inactive mothers with a child aged 1-2;
- Economically inactive mothers in a couple with a child aged 3-4;
- Economically inactive mothers with a child aged 3-4.

The ONS publishes estimates of economic activity by various types of family dynamics. The three of particular interest to this analysis are:

- Economically inactive women with children: 24.4%
- Economically inactive lone mothers: 32.9%
- Percentage of fathers in work: 92.1%

The ONS also publishes data on number of families by family type: married couple, civil partnerships, opposite sex couple, same sex couple and lone parent family. This is also disaggregated by whether the family has a dependent child (a child under the age of 18), non-dependent child or no children. For our analysis we are specifically interested in the number of mothers with dependent children.

From this dataset we can assume that each family couple type has a mother on average, and we have the raw data on lone mothers. Additionally, we have assumed that the 6,000 same sex couples with dependent children exhibit an equivalent behavioural response to the provision of free childcare. This then provides the total number of mothers in the UK with a dependent child and a subset of lone mothers with dependent children.

Of these mothers with dependent children, it needs to be established how many have children aged 1 to 4 – the area of focus for the childcare policy. Data on the number of children by age allows us to distribute the total number of mothers and lone mothers to those that had children aged 1 to 2 and 3 to 4 – this is then the total pool of mothers. This step relies on the assumption that the distribution of children by age marries up to the distribution of families.

Applying the ONS' estimates on economic activity to this pool produces the target pool of mothers for the policy; mothers with children aged 1 to 4 that were economically inactive. The final step was stripping the number of lone mothers from the total number of mothers to create four categories: lone mothers with children aged 1 to 2 and 3 to 4 and mothers in a couple with children aged 1 to 2 and 3 to 4. The distinction of 1- to 2- and 3- to 4-year-olds is necessary for step 3.

Note, due to data limitations there may be some small levels of double counting between the two groups, 1 to 2 and 3 to 4, and an overestimation of the responsiveness of mothers that may also have a child aged up to 1.

#### *B. Estimating the effective change in disposable income from the provision of childcare*

The methodology employed to estimate the likely number of mothers returning to employment from the provision of childcare is based on an income elasticity (see C.). To apply the elasticity, the change in mothers' potential income needs to be established. This needs to be done for both median incomes for mothers with children aged 1 to 2 and 3 to 4 due to the variation in childcare entitlement and thus average costs of childcare.

We assume that mothers that want to return to work want to return to 21.3 hours per week on average, based on the CPP survey. Using the ASHE median earnings data, this equates to a median annual salary of £13,553. Using the Government's tax calculator, this produces a net expected income of £13,240.

The average annual part-time cost of childcare for children aged under 2 is estimated by the Family and Childcare Trust to be £7,210. Thus, should no Government provision of childcare occur and the mother with a child aged 1 to 2 returns to work, their net income after childcare would be £6,030 (median net income minus cost of part-time childcare).

A full provision of childcare i.e., Government providing the £7,210 per year, would then be pure income gain for the mother that returns to work. Thus, their net income would effectively rise to £13,240 – an increase of 120% from the provision of childcare. This 120% is the key output for the analysis used in stage 3 for mothers with children aged 1 to 2.

This process is repeated for mothers with children aged 3 to 4. The Family and childcare Trust estimates that average part-time cost of childcare for children 3 to 4 is £2,813 annually, inclusive of the free hours entitlement.

A full provision of childcare for this group would then result in an income gain of £2,813 to the mother with children aged 3 to 4. This results in an income increase of 27%. The significant cost difference and hence change in income difference is driven by the entitlement to free hours, lowering the overall average cost of childcare for 3- to 4-year-olds relative to 1- to 2-year-olds. This 27% is the key output for the analysis used in stage 3 for mothers with children aged 1 to 2.

*C. Estimating the return rate and the volume of mothers likely to return to employment from the provision of childcare*

The Institute for Fiscal Studies report “*An ex-ante analysis of the effects of the UK Government’s welfare reforms on labour supply in Wales*” estimates the elasticity of employment on the extensive margin from changes in income by gender and child dependency. The elasticities relevant for this analysis are:

- Lone mother with child aged 0 to 2: 0.096
- Lone mother with child aged 3 to 5: 0.483
- Mother with working partner and child aged 0 to 2: 0.139
- Mother with working partner and child aged 3 to 5: 0.174
- Mother with non-working partner and child aged 0 to 2: 0.070
- Mother with non-working partner and child aged 3 to 5: 0.089

These elasticities were then multiplied against the expected increase in income, 120% for mothers with children aged 1 to 2 and 27% for those with children aged 3 to 4, to produce the likelihood of mothers returning to employment for the given income gain. For mothers with partners, both working and non-working, a weighted elasticity was established using the ONS’ rate of father employment.

These two likelihood estimates were then multiplied against the pool of mothers in a couple with children and lone mothers economically inactive to produce the expected number of mothers to return to employment from the full provision of childcare. The results are:

	Expected number to return	Increase to female employment	Increase to total employment
<b>Mothers with children aged 1 to 2</b>	46,000	0.42%	0.21%
<b>Mothers with children aged 3 to 4</b>	14,000	0.13%	0.06%

<b>Mothers with children aged 1 to 4</b>	60,000	0.55%	0.27%
--	--------	-------	-------

For sensitivity analysis, this methodology was repeated for median part-time salary and median full-time salary, taking into consideration the differences in median annual net salary and average full-time and part-time childcare costs – results are detailed below in Stage 3.

*Stage 3: Estimating the impact of mothers returning to work on GDP, accounting for age, gender, and work pattern differences in the labour market*

To estimate the GDP uplift from workers returning to employment, how much each worker (in this case each mother) adds to the economy needs to be established. The ONS publishes data on GVA (Gross Value Added) per capita but does not disaggregate this figure. The figure for 2019 was £58,871, i.e., the average additional value provided to the economy by each worker was £58,871 in 2019. Taking 2019 as the base for this analysis excludes the anomalies faced during the pandemic period where employment fell due to furlough and total output in the economy shrank significantly due to lockdowns. This analysis does not consider differences in GVA per capita in different industries.

However, simply using the GVA per capita figure and scaling up for the likely mothers returning to work was not expected to provide a fair reflection of the potential impact of this policy. The next step was to create a proxy of GVA per capita disaggregated by gender, age bracket and full-time and part-time employment.

The ONS publishes the Annual Survey of Hours and Earnings (ASHE) which includes a breakdown of median pay by age, gender and full-time and part-time work which acts as a good proxy to reallocate the £58,871 UK wide GVA per capita to specific sub-groups. This lets us account for age, gender, and work pattern differences in the labour market.

The ONS also publishes the average age of mothers in the UK; 30.7 years of age in 2020 (most recent data). From the ASHE data and this we know which gender age sub-group from the GVA proxy would provide the best approximation. The effective GVA per mother that would return to work if childcare were sufficient is £67,078 for full-time employment and £27,262 for part-time.

The estimated impact on GDP was based first on the impact of every 10,000 additional mothers returning to employment, followed by estimating the impact of the expected 60,000 returning to work on their desired hours.

Based on the above:

- For every 10,000 additional mothers returning to employment on their *desired hours* at average productivity, UK GDP would be expected to increase by £290 million, ceteris paribus;
- For every 10,000 additional mothers returning to *full-time* employment at average productivity, UK GDP would be expected to increase by £670 million, ceteris paribus; and,
- For every 10,000 additional mothers returning to *part-time* employment at average productivity, UK GDP would be expected to increase by £270 million, ceteris paribus.

Thus, we have an upper, lower and desired hours estimate depending on the degree to which 10,000 mothers were to rejoin the workforce. GDP would be expected to increase by between £270 and £670 million with a desired hours scenario of £290 million.

Using the income elasticity estimate on the extensive margin, we expect 60,000 mothers to return to work at their desired hours of 21.3 per week. This suggests an aggregate GDP impact of £1.7 billion – equivalent to 0.09% of GDP – from the likely numbers of mothers returning to work from sufficient provision of childcare.

Full sensitivity results:

	Expected number to return to employment	GDP impact, £bn	Percentage of GDP
<b>Mothers returning on desired hours</b>	60,000	£1.7	0.09%
<b>Mothers returning on part-time hours</b>	65,000	£1.8	0.09%
<b>Mothers returning on full-time hours</b>	62,000	£4.1	0.20%

Note, full-time hours produce a greater estimate due to the large difference in GVA per capita between full-time and part-time workers, £67,078 against £28,262, and thus should be thought of as a maximum in this analysis.

The number of mothers returning on part-time hours is larger than desired hours due to the way in which the likelihood of returning is calculated. As described in section 3, the key driver is expected change in income. The median part-time salary is £12,853 which is lower than the desired hours of £13,553 driven by the fact that average part-time hours is 1.1 less per week than estimated desired hours. Part-time childcare cost does not differ and thus the effective salary gain is larger for part-time returnees; 130% to the desired hours' 120%.

There is also no attempt to measure the GDP impact from insufficient childcare on mothers who are in employment that may increase their hours worked – the intensive margin. We have only measured the effective gain from those rejoining employment itself, thus we would expect a greater overall GDP impact than estimated above.

#### *Stage 5: Estimating the dynamic impact of mothers returning to employment on the UK economy*

A separate, but complementary, analysis was completed on the medium-term dynamic effect of the 60,000 mothers returning to work. This analysis is done using Oxford Economics' Global Economic Model. This analysis does not specifically estimate where the additional employment comes from, rather just applies an uplift based on two scenarios:

1. *Total increase in employment occurs within a year of policy implementation; and*
2. *Total increase in employment occurs within three years of policy implantation.*



The flow of workers into employment in this dynamic model is steady and begins in Q2 2023. Under scenario one we model the 60,000 flowing equally into employment across four quarters to Q1 2024. Under scenario two, the flow is across 12 quarters to Q1 2026. The 60,000 increase to employment is permanent and comparisons are against the current baseline model with no uplift in employment from childcare policy provision.

The key outputs of this model are:

- A level impact on GDP;
- A percentage point difference impact on GDP growth; and
- A level impact on Government tax revenues.

## Bibliography

- Family and Childcare Trust, *Childcare Survey 2022*, 2022, [https://www.familyandchildcaretrust.org/sites/default/files/Resource%20Library/Final%20Version%20Coram%20Childcare%20Survey%202022\\_0.pdf](https://www.familyandchildcaretrust.org/sites/default/files/Resource%20Library/Final%20Version%20Coram%20Childcare%20Survey%202022_0.pdf)
- GOV.uk, *Estimate your Income Tax for the current year*, 2022, <https://www.tax.service.gov.uk/estimate-payee-take-home-pay/your-pay>
- Institute for Fiscal Studies, *An ex-ante analysis of the effects of the UK Government's welfare reforms on labour supply in Wales*, 2013, [https://ifs.org.uk/sites/default/files/output\\_url\\_files/r75.pdf](https://ifs.org.uk/sites/default/files/output_url_files/r75.pdf)
- ONS Annual Survey of Hours and Earnings, tables 1.7a, 1.9a and 6.7a, 2022
- ONS, *A05 NSA: Employment, unemployment and economic inactivity by age group (not seasonally adjusted)*, 2023, <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/datasets/employmentunemploymentandeconomicinactivitybyagegroupnotseasonallyadjusted05nsa>
- ONS, *Birth characteristics in England and Wales: 2020*, 2022, <https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/bulletins/birthcharacteristicsinenglandandwales/2020>
- ONS, *Families and households*, 2022, <https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/families/datasets/familiesandhouseholds/familiesandhouseholds>
- ONS, *Families and the Labour Market, UK: 2021*, 2022, <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/articles/familiesandthelabourmarketengland/2021>
- ONS, *Gross Value Added (Average) at basic prices: CP SA £m*, 2023, <https://www.ons.gov.uk/economy/grossvalueaddedgva/timeseries/abml/pn2>
- ONS, *Half a million more people are out of the labour force because of long-term sickness*, 2022, <https://www.ons.gov.uk/employmentandlabourmarket/peoplenotinwork/economicinactivity/articles/halfamillionmorepeopleareoutofthelabourforcebecauseoflongtermsickness/2022-11-10>
- ONS, *Subregional productivity: labour productivity indices by UK ITL2 and ITL3 subregions*, 2022, <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/labourproductivity/datasets/subregionalproductivitylabourproductivitygvaperhourworkedandgvaperfilledjobindicesbyuknuts2andnuts3subregions>
- ONS, *Subregional productivity: labour productivity indices by UK ITL2 and ITL3 subregions*, 2022, <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/labourproductivity/datas>

[ets/subregionalproductivitylabourproductivitygvaperhourworkedandgvaperfilledjobindicesbyuknuts2andnuts3subregions](#)

- ONS, *Gross Value Added (Average) at basic prices: CP SA £m, 2023*, <https://www.ons.gov.uk/economy/grossvalueaddedgva/timeseries/abml/pn2>
- ONS Annual Survey of Hours and Earnings, tables 1.7a, 1.9a and 6.7a, 2022
- ONS, *Birth characteristics in England and Wales: 2020, 2022*, <https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/bulletins/birthcharacteristicsinenglandandwales/2020>
- ONS, *A05 NSA: Employment, unemployment and economic inactivity by age group (not seasonally adjusted), 2023*, <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/datasets/employmentunemploymentandeconomicinactivitybyagegroupnotseasonallyadjusted/a05nsa>
- Statista, *Population of the United Kingdom in 2021, by age, 2022*, <https://www.statista.com/statistics/281174/uk-population-by-age/>
- The Centre for Progressive Policy, *Women in the labour market, 2021*, <https://www.progressive-policy.net/downloads/files/PPP-report-women-in-the-labour-market-Oct-2021-2.pdf>