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ABSTRACT

Does Breastfeeding Support at Work Help Mothers and Employers at the Same Time?*

This paper asks whether the availability of breastfeeding facilities at the workplace helps to reconcile breastfeeding and work commitments. Using data from the 2005 UK Infant Feeding Survey, we model the joint probability to return to work and breastfeeding and analyse its association with the availability of breastfeeding facilities. Our findings indicate that the availability of breastfeeding facilities is associated with a higher probability of breastfeeding and a higher probability to return to work by 4 and 6 months after the birth of the child. The latter effects are only found for women with higher levels of education.

JEL Classification: J13, C26

Keywords: breastfeeding, cognitive development, child outcomes

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1. Introduction

A large body of epidemiological studies suggest that breastfeeding is associated with significant health benefits for children. These benefits are wide ranging, including lower incidence of asthma, allergy and respiratory illnesses, fewer infections of the gastrointestinal tract, middle ear and urinary tract with consequently lower rates of hospitalisations (American Academy of Pediatrics 1997, Quigley et al. 2007). Breastfeeding mothers are also found to be less likely to develop breast or ovarian cancer and to exhibit a lower incidence of type II diabetes (Ip et al. 2007). More recently, new research has found positive effects of breastfeeding on children's psychosocial and cognitive development (Sacker et al. 2006, Iacovou and Sevilla-Sanz 2010, Heikkila et al. 2011, Del Bono and Rabe 2012, Rothstein 2012).

On the basis of this evidence, numerous public health agencies promote initiatives to increase the incidence and the duration of breastfeeding. The American Academy of Pediatrics (2005) recommends exclusive breastfeeding for the first 6 months of a child's life and then continued breastfeeding through at least the first year. The World Health Organization goes even further, recommending breastfeeding alongside solid foods for up to two years (World Health Assembly 2001). The UK Department of Health has not only adopted the WHO recommendation, but has also funded several initiatives to increase breastfeeding rates, particularly among more disadvantaged groups of mothers (Department of Health 2003).

Despite these efforts, rates of breastfeeding in most developed countries remain largely below the proposed targets. For example, in 2002 about 70% of mothers in the United States initiated breastfeeding in hospital, but only 33% were still breastfeeding when their child was 6 months old (Abbott Laboratories, 2003). For the UK about 76% of mothers breastfeed soon after birth, and more than a third of them stops by 6 weeks (Bolling et al., 2007).

Barriers at the workplace might exacerbate the problem, contributing to many women's decision to stop breastfeeding long before the minimum period recommended. According to data from the 2005 UK *Infant Feeding Survey*, among women who are at work by the time the child is 4 months old the incidence of breastfeeding is 25.1%, while the corresponding percentage for non-working mothers is 34.0%. Similarly, at 6 months after birth only 15.7% of working mothers are still breastfeeding, against 27.4% of non-working mothers.

Public health campaigns aimed at promoting breastfeeding for mothers returning to work advocate breastfeeding support at the workplace and emphasise two important potential benefits to employers. Breastfeeding mothers may be absent from work less because their babies suffer from fewer illnesses, and employers who support breastfeeding at work may be more successful in retaining their employees (Maternity Alliance 1997). However, there is very little empirical research into whether these benefits do in fact accrue to employers. The main exception is a study on maternal absenteeism conducted in the U.S. (Cohen et al. 1995), which found that

infants of breastfeeding mothers exhibit fewer severe illnesses and rates of maternal absence up to three times lower than those of mothers with formula-fed babies. No similar research has been carried out in the UK.

Our paper contributes to this literature by analyzing the potential benefits of breastfeeding from the point of view of the employer as well as the employee. In particular, we ask whether the availability of breastfeeding facilities at the workplace helps to reconcile breastfeeding and work commitments. Although several studies have looked at the impact of family-friendly policies on maternal employment (see Heywood et al. 2011 for a review), and a few have also considered breastfeeding (see Hawkins et al. 2007 for evidence on the UK), this is the first analysis which takes into account the presence of breastfeeding facilities. It is also the first study that looks at the role of workplace characteristics in relation to breastfeeding and employment for the UK.

We model the association between the presence of breastfeeding facilities and the probability to return to work and continue breastfeeding using a bivariate probit. This allows us to take into account the fact that the decisions to return to work and to continue to breastfeed are joint decisions, influenced by the same set of observable and unobservable variables. Our model is estimated on a sample of women who are working by the time the child is 8-10 months old, and who have initiated breastfeeding. Our findings indicate that the availability of breastfeeding facilities is associated with an increase in breastfeeding durations and a reduction in time spent on maternity leave, but the latter effect is found only for women with higher levels of education. The effect is of a 5 percentage increase in the probability of working at 4 months and an 8 percentage increase in the probability of working at 6 months. These are non-negligible effects, and suggest that providing breastfeeding facilities might be of benefit to employers, mothers and babies alike. We consider whether working in a firm which offers breastfeeding facilities is correlated with positive attitudes to breastfeeding or breastfeeding intentions, but find no evidence in this respect.

The next section briefly reviews the literature on maternal employment and breastfeeding before focusing on studies that consider the role of workplace characteristics. We then discuss the data and the sampling issues we face. The empirical model is presented in section 4. Section 5 reports our main results, while section 6 examines the potential endogeneity of breastfeeding facilities. Section 7 concludes.

2. Previous literature

2.1 Breastfeeding and maternal employment

From an economic perspective, the negative relationship between breastfeeding and maternal employment is the result of the fact that breastfeeding is an activity which is intensive in maternal time and therefore in direct competition with other uses of it, including market work. This implies that the opportunity cost of breastfeeding can be measured in terms of the costs of absence from work. Within a standard neoclassical framework, the optimal amount of breastfeeding will be chosen so that its marginal benefit equals its marginal cost. As it is assumed (perhaps incorrectly) that the marginal benefits of breastfeeding diminish over time while the marginal costs of not working increase over time, there is a simple theoretical justification for the observed negative relationship between the duration of breastfeeding and the duration of maternity leave. If, in addition to this, it is also assumed that breastfeeding entails some fixed-costs, such as the costs of purchasing special clothes, attending classes, and psychological adjustments (Chatterji and Frick 2005), then a negative relationship between maternal labour supply and breastfeeding initiation might also arise.

Previous studies provide evidence of a significant negative relationship between maternal employment and breastfeeding durations. Evidence of a relationship between maternal employment and breastfeeding initiation remains more mixed. Most of the earlier studies assume, however, that employment decisions are exogenous to breastfeeding (Kurinji et al. 1989, Gielen et al. 1991, Lindberg 1996, Visness and Kennedy 1997, Fein and Roe 1998).

More recent papers model the duration of breastfeeding and the duration of maternity leave as jointly determined, trying to identify the direction of causality using different methods. For example, Roe et al. (1999) implement an instrumental variable strategy using maternal occupation and availability of maternal leave as direct determinants of maternal employment but not of breastfeeding. They find negative and significant effects of work leave and work intensity (hours) on breastfeeding leave and intensity (number of breast-feeds per day). Chatterji and Frick (2005) use a family fixed-effect estimator, using variation in the duration of leave and breastfeeding across siblings. They find significant negative effects of maternal employment on both breastfeeding initiation and durations. In the most convincing attempt to date to get to the causal effect of maternal employment on breastfeeding duration, Baker and Milligan (2008) exploit an exogenous increase in maternity leave entitlement brought about by a change in the legislation in Canada. Their results show that the 6-month increase in entitlement increased maternal breastfeeding durations by approximately 3 to 3.5 months but had very little effect on initiation.

2.2 The role of workplace characteristics

Although the evidence indicates that maternal employment and breastfeeding are negatively correlated on average, they are not incompatible, and many working mothers do feed their children breast milk (Ortiz et al. 2004). In fact, there is a great variety of feeding practices among working women. One way of explaining this diversity of arrangements is to look at differences in workplace characteristics. Indeed, breastfeeding studies often mention aspects of the workplace as potentially important in maintaining breastfeeding rates among working mothers. Among the most cited workplace characteristics in this context are the availability of on-site nurseries, extended breaks, facilities to express and store milk, lactation rooms and lactation consultants or programmes (Johnston and Esposito 2007, Mills 2009).

There is however still very little evidence of the true effectiveness of these workplace characteristics in increasing breastfeeding rates and durations among working women (Hawkins et al. 2007, Jacknowitz 2008) and some indication that the effects are not the same for all groups (Chun Chen et al. 2006).[1] Even less attention has been paid to these policies' effects on women's labour force participation, either in terms of turnover, absenteeism or length of maternity leave. Most of those who advocate that creating a breastfeeding friendly workplace has benefits for employers refer to the evidence presented in a study conducted by Cohen et al. (1995), who carried out a comparison of breastfeeding and non-breastfeeding mothers' rates of absenteeism in two corporations implementing a lactation programme. The authors found fewer and less severe infant illnesses and lower rates of maternal absenteeism among the breastfeeding group, but the study was not experimental and based on a very small sample of observations (101 participants in total).

Yet, establishing whether breastfeeding-friendly working environments could benefit employers as well as employees is very important. A substantial literature in personnel economics looks at the effects of family friendly working practices on various outcomes, including rates of absenteeism and retention. There is an emerging consensus that these types of practices can be divided into two groups. Some policies - such as the provision of on-site nurseries, flexible working yours, working from home, and job sharing - are mainly productivity enhancing (Lehrer et al. 1991, Brown and Sessions 1996, Hill et al. 2001, Heywood and Jirjahn 2004, Eldridge and Pabilonia 2007) and therefore might be offered at no extra cost to employees. Other policies - such as the provision of longer maternity leaves - are mainly costly to the employer and associated with wage reductions (Heywood et al. 2007).

[1] In the study by Hawkins et al. (2007), two types of workplace arrangements were analysed. Family-friendly work arrangements were defined as the employer offering day-care vouchers or assistance with day care. Flexible arrangements were defined as the employer offering part-time working, job sharing, flexible working hours, or school-term contracts. Data are from the UK Millennium Cohort Study, which has no specific information about breastfeeding facilities (see below).

So, analysing what effect breastfeeding-friendly practices might have not only on breastfeeding rates or durations but also on aspects of female labour force participation is important in order to gauge who is going to bear the costs of the implementation of these policies and how likely they are to be implemented in the absence of legislation.[2] Our study thus represents a significant contribution to this literature, in that (i) it asks whether the availability of breastfeeding facilities and other family-friendly policies encourages women's labour force participation as well as breastfeeding, (ii) it does so using recently available data for the UK, and (iii) analyses separately the effects on different groups of mothers.

3. Data

The *Infant Feeding Survey* (IFS) has been carried out every five years since 1975. The main aim of the survey is to provide estimates on the incidence, prevalence, and duration of breastfeeding and other feeding practices adopted by mothers in the first eight to ten months after their baby was born. The survey is based on an initial representative sample of mothers who were selected from all births registered during August and September/October of the relevant year in all UK countries.[3] Three stages of data collection were conducted with each survey; the first stage took place when babies were four to ten weeks old, the second one when they were four to six months old, the third one when they were eight to ten months old. At all stages mothers were asked to return a postal questionnaire.[4]

Apart from providing information on incidence, prevalence (exclusivity) and duration of breastfeeding at various points in time, the survey is rich in other information related to breastfeeding. For example, mothers are asked about their breastfeeding intentions during pregnancy, their breastfeeding problems, and the type of breastfeeding support they received before and after the birth of their child. The survey also contains information about other infant feeding practices, such as the timing of introduction of cow's milk or solid foods. There is a well-structured section on pregnancy habits, including mother's drinking and smoking habits, and in more recent years a small section on child health. General demographic characteristics of the individual, such as mother's age at birth, level of education and family size are collected in the first stage. Information on maternal employment, including some characteristics of the employer, are also collected at stage two and three.

[2] We should note here that there is at present no legal obligation for employers to offer breastfeeding facilities at the workplace in the UK. The Health and Safety Work Regulations 1999 indicate that a breastfeeding mother should have access to a safe place where to breastfeed or express and store breast milk (http://www.hse.gov.uk/mothers/law.htm), but this is seen as an example of good practice rather than a requirement for the employer.

[3] The 1985 survey, which is the first survey available through the UK Data Archive, does not cover Northern Ireland.

[4] For more information on the IFS surveys see: http://www.ic.nhs.uk/ifs.

We use this information to show how rates of breastfeeding and employment after the birth of a child have changed over time. Starting from 1985 and going on until 2005, figure 1 shows the percentage of women working or breastfeeding at different points in time during the first year of life of the child. Since information on the precise duration of maternity leave is not collected at every survey, we simply consider here mothers' employment and breastfeeding status at each survey stage, that is at 4-10 weeks, 4-6 months, and 8-10 months after birth.

As the top panel in figure 1 shows, rates of mother's employment are extremely low at 4-10 weeks, and have been decreasing over time. On the other hand, rates of employment at 4-6 months and 8-10 months are much higher and have been steadily increasing during the period between 1985 and 2000. The sharp drop in maternal employment between 2000 and 2005 is to be attributed to the implementation of the Employment Act 2002, which extended paid maternity leave entitlement from 18 to 26 weeks and granted an additional 26 weeks of unpaid leave to mothers with at least 26 weeks of tenure. The bottom panel of figure 1 reports rates of breastfeeding. Here we observe how breastfeeding becomes less prevalent as the child ages. There is also an interesting trend over the years, with the incidence of breastfeeding increasing steadily from 1985 to 2005, particularly at shorter durations.

Figure 2 disaggregates the previous analysis by considering women with different levels of education. As we will discuss below, we define higher educated women as those women who left full time education at age 19 or more. Lower educated women are those who left full time education at age 18 or earlier.[5] As we can see, there are no major differences in rates of female employment after birth between high and lower educated women up to 4-6 months. However, higher educated women are significantly more likely to be in work by the time the child is aged 8-10 months. One possible interpretation for this finding is that lower educated women are overall less likely to go back to work after the birth of a child, but that those who do go back return sooner than higher educated women. We will return to this point in our analysis below.

What is most striking, however, is the dramatic difference in rates of maternal breastfeeding between these two groups (lower panel of figure 2). Between 66 and 70% of mothers with higher levels of education is still breastfeeding when the child is approximately 2 months old. The corresponding figures for lower educated mothers are between 30 and 35%, less than one half of the rates observed for the other group. At 4-6 months, rates of breastfeeding are between 50 and 55% for higher educated mothers and between 20 and 25% for lower educated mothers. Similarly, at 8-10 months we find that only 7 to 12% of mothers with lower levels of education

[5] The IFS has no information on levels of qualification unfortunately. These two groups are chosen on the basis of two considerations. The first is to have two sub-samples with a relatively similar number of observations; the second is to compare individuals with very different levels of qualifications on average. According to data from the Labour Force Survey for the years 2000 and 2001, 74.8% of women aged 16-49 who had left full time education at 18 or earlier had a level of qualification below A-level, while 83.7% of those who had left full-time education after age 18 had a level of qualification equivalent or higher than A-levels.

are still breastfeeding, the corresponding percentage among the higher educated group is more than twice this, at 22 to 29%.

The other interesting finding in the lower panel of figure 2 is that we see that the rates of maternal breastfeeding have changed little over the course of the last 20 years. In particular, we do not see much difference over time in the breastfeeding rates of higher educated mothers, and only a slow increase for lower educated mothers. It follows that the pattern observed in figure 1, where we saw rates of breastfeeding increasing over the last two decades, is due to a general trend towards increasing levels of education in the population.

3.1 The sample

The 2005 *Infant Feeding Survey* was the seventh national survey of infant feeding practices to be conducted in the UK. It is the only UK survey which provides information on the availability of breastfeeding facilities (either to express or to actually breastfeed) at work. Other surveys which collect information on breastfeeding from individual mothers, such as the *Avon Longitudinal Study of Parents and Children* (ALSPAC) and *Understanding Society*, do not ask any questions about facilities provided by the employer which could facilitate the reconciliation of motherhood and work. The *Millennium Cohort Study* collects information on the availability of family friendly policies, such as part-time work, shift work, or the availability of a crèche, but nothing specifically related to breastfeeding facilities.

One problem, however, is that the IFS asks questions about the availability of breastfeeding facilities only of working mothers at stage two and stage three. That is, we do not know anything about the characteristics of the workplace for mothers who are still on maternity leave by the time stage three is carried out.[6] Ideally, we would like to have information on breastfeeding facilities for all mothers who are working during their pregnancy. This would allow us to analyse whether these workplace characteristics influence women's propensity to return to work after the birth of their child as well as the duration of their maternity leave. Given the constraint imposed by the data, we can only analyse whether the availability of breastfeeding facilities at the workplace is associated with a shorter period of maternity leave, and we can do so only on the sample of mothers who are at work in stage three, i.e. when their child is aged 8-10 months.

We therefore face selection issues which need to be carefully considered. Table 1 provides information on the sample selection process we follow in order to achieve our final sample of mothers. The initial sample interviewed at stage one consists of 12,290 women. From this we

[6] A similar problem is to be found in the Millennium Cohort Study, where questions on the availability of family friendly policies and facilities are only asked of mothers who are working at the time of the first survey, which takes place when the child is approximately 9 months old.

select only singleton births and drop a small number of observations with missing values on variables which are particularly important for our analysis, such as the age of the mother and her level of education. We are left with a sample of 11,728 mothers, 10,876 of whom have held a job in the past (88.5% of the original sample).[7]

The subsequent selection is due to the fact that we need to restrict our analysis to women who reply to the stage three questionnaire. This implies a further drop in the number of observations, which is now down to 8,494 (69.0% of the original sample). Selecting only women working at stage three, and for whom we have information about employer-provided facilities reduces the sample to 4,359 observations, 4,008 of which are employees (32.6% of the original sample). Finally, as we want to look at the association between workplace breastfeeding facilities and breastfeeding as well as the duration of maternity leave, we restrict our attention to mothers who have at least initiated breastfeeding. This final selection takes the number of mothers in our data to 3,094 (25.2% of the original sample).

As our final sample consists of only a quarter of the original sample of observations, we cannot generalise our findings to the entire UK population of mothers (including for example mothers who never worked either before or after having had a child, or mothers who never tried to breastfeed). However, our results are still relevant for the sub-population of women that exhibits a relatively strong attachment to the labour market and a significant propensity to breastfeed. These are the women for whom the availability of breastfeeding-friendly workplaces is likely to matter most. So, in this sense the selection of this particular sample does not necessarily represent a limitation of our analysis.

Table 2 describes the main variables of interest and provides further evidence that selection issues are not a cause concern. In particular, we compare sample (d) to sample (e) in order to consider the effect of attrition, since our analysis is restricted to women who respond to the third questionnaire. As we can see, at least in terms of breastfeeding initiation, mothers who respond to the third survey are very similar to all mothers interviewed in the initial sample. In terms of their characteristics, mothers in sample (e) are slightly older, more educated and more likely to be married, but their mean number of children is very similar to that of the whole sample of mothers and so are the characteristics of their children. Restricting to women employees at stage three brings us to sample (g). Again, the characteristics of this sample are not very different from that of the general sample of women respondent at stage three (sample (e)). The only significant differences are in terms of breastfeeding and working behaviour. As these women exhibit a stronger attachment to the labour market, they are not surprisingly also found to be less likely to

[7] We do not know whether the individual has held a job during pregnancy; however data from the Millennium Cohort Study show that 94.7% of mothers who have had a job in the past and are working by the time the baby is 9 months old have also held a job during their pregnancy. So, selecting on the mothers who have had a job in the past is a close approximation to selecting mothers who were working during pregnancy.

breastfeed and more likely to work at 4 and 6 months than the general sample of women who respond to the stage three questionnaire.[8]

We finally compare sample (g) to sample (h), as we include in our analysis only women who have at least tried to breastfeed for one day. Here we see that the incidence of breastfeeding at 4 months and 6 months increases, while the probability of having returned to work by 4 and 6 months slightly decreases, as it is to be expected, but the general characteristics of the mothers and the children remain very similar. For these two samples it is also interesting to compare the characteristics of the job and the availability of facilities and policies which might facilitate combining work and breastfeeding. If we were to observe statistically significant differences in the distribution of the sample according to these variables we might suspect that mothers with a propensity to breastfeed select themselves into jobs or firms with different facilities/policies. As we can see, although there are small differences, these are not statistically significant. In general, therefore, the selection process does not represent a cause of concern.

We perform our analysis on the whole sample of individuals thus selected, and on the subsamples of mothers with lower and higher levels of education separately. This is because there are likely to be important differences in breastfeeding and working behaviour for these two groups of women which is important to take into account (see figure 2). In particular, it is well-known that breastfeeding rates are higher for more educated women and that this group also tends to breastfeed for longer periods of time. At the same time, more educated mothers generally exhibit a stronger attachment to the labour force. So, we might expect that the availability of breastfeeding facilities is more important for this group.

Table 3 explores differences in characteristics and behaviour of higher and lower educated mothers in some detail. First we look at labour market status at stage three to analyse whether we observe statistically significant differences in the probability of going back to work by the time the child is aged 8-10 months between these groups. Indeed, panel A shows that 53% of highly educated mothers are working at stage three, against 45.9% in the lower education group. This difference is explained by the fact that lower educated mothers are 1.5 times more likely to be inactive than higher educated mothers while higher educated mothers enjoy longer periods of maternity leave. As we can see from the χ^2 statistics, these differences in labour market status at stage three are statistically significant at the 1% level.

Panel B of table 3 considers differences by level of education in the outcome variables (breastfeeding behaviour and working status at 4 and 6 months) and in the availability of

[8] Most information asked in the survey is expressed in terms of categorical variables, which have been included in our analysis through the use of dummy variables. Given the large number of variables we control for, and in order not to reduce the sample size even further, we keep observations with missing values among some of the regressors, using a dummy indicating missing values as an additional category. Our results are robust to excluding these observations.

facilities and family-friendly policies among mothers who are observed working in stage three and have at least some experience of breastfeeding (sample (h)). The most significant differences between these two groups are found in respect of breastfeeding behaviour. As we can see, more highly educated mothers are 23.2 percentage points more likely to breastfeed at 4 months and 15.5 percentage points more likely to breastfeed at 6 months. There are also some significant differences in relation to the duration of maternity leave. Conditioning on working at stage three, less educated mothers are 7.6 percentage points more likely to be at work at 6 months. Differences in working status at 4 months are not significant however.

Next we look at the availability of breastfeeding facilities. This is because higher educated mothers might be in better jobs or firms, and therefore enjoy better access to employer-provided facilities. As we can see, while the difference in the probability of having access to facilities to express milk is statistically significant, the magnitude is quite small, with higher educated mothers being only 3.5 percentage points more likely than lower educated mothers to have access to these facilities. Notice also that there is almost no difference in access to facilities to breastfeed. In terms of other family friendly policies, we see almost no differences in these groups. The main exception is related to the availability of shift patterns, which is more common for lower educated mothers.

Taken together, the evidence presented in table 3 shows that the main difference between lower and higher educated mothers is in their observed breastfeeding duration and observed length of maternity leave. More educated mothers are much more likely to breastfeed for longer periods of time than less educated mothers, and enjoy longer maternity leave spells. We therefore expect that the availability of breastfeeding facilities might help mainly this group of women to reconcile breastfeeding with work.

4. Empirical strategy

Previous literature has focused on the effect of family-friendly workplace characteristics on the probability of breastfeeding (Chun Chen et al. 2006, Hawkins et al. 2007, Jacknowitz 2008). In this work, we want to consider the problem from a different angle, taking an employer's perspective. In order for employers to offer breastfeeding facilities or family-friendly policy schemes to their employees (at no additional cost to them) there has to be a return in terms of (i) lower turnover or (ii) increased labour force participation either in terms of shorter maternity leave or lower absenteeism. While breastfeeding advocates often argue that these benefits accrue to employers who facilitate breastfeeding at the workplace, the empirical evidence in support of these claims is actually quite limited and dated (Cohen et al. 1995).

As explained in the previous section, due to the fact that information on breastfeeding facilities and other family-friendly policies is only asked of working mothers, we cannot provide any new evidence about turnover. Also, we do not have any information about absenteeism. Using the IFS data, however, we can analyse whether the presence of breastfeeding facilities and the availability of family-friendly workplace policies, such as the presence of part-time or flexi-time arrangements, has an impact on the working status of the mother, and in particular on the length of her maternity leave.

Let us consider more formally the model we would like to estimate in order to capture the effect of breastfeeding facilities. We start from a model in which the decision to go back to work and the decision to breastfeed are simultaneously determined. That is, we have a system of equations specified as follows:

$$W_i^* = \beta_1' X_i + \gamma_1' WC_i + \delta_1 B_i^* + \varepsilon_{1i}, \quad (1)$$

$$B_i^* = \beta_2' X_i + \gamma_2' WC_i + \delta_2 W_i^* + \varepsilon_{2i}, \quad (2)$$

where W_i^* and B_i^* are two unobserved random variables capturing the propensity to work and breastfeed after the birth of the child, X_i is a vector of mother and child-specific variables, WC_i is a vector of workplace characteristics and β_1, β_2, γ_1, and γ_2 are vectors of unknown parameters and δ_1 and δ_2 are scalars of unknown parameters. It is further assumed that $\{\varepsilon_{1i}, \varepsilon_{2i}\}$ are i.i.d. bivariate normal variables.

Contrary to what is commonly assumed, no exclusion restrictions are needed to identify the model (Heckman 1978, Wilde 2000). However, it is good practice to identify the effect of the endogenous regressors using at least one exclusion restriction. So, we would need to find a variable which affects the decision to breastfeed directly but has no impact on the decision to work if not through breastfeeding. Similarly, we would need to find another variable which affects the mother's labour force status but does not exert a direct effect on breastfeeding. In the absence of plausible identifying restrictions, the only model we can estimate is the following reduced-form model:

$$W_i^* = \tilde{\beta}_1' X_i + \tilde{\gamma}_1' WC_i + \upsilon_{1i}, \quad (3)$$

$$B_i^* = \tilde{\beta}_2' X_i + \tilde{\gamma}_2' WC_i + \upsilon_{2i}, \quad (4)$$

where the parameters are a combination of the structural parameters of interest. In particular, the main vector of parameters we are interested in, $\tilde{\gamma}_1$, will capture the direct effect of breastfeeding facilities on W_i^*, γ_1, as well as the indirect effects of these facilities on W_i^* which operate through breastfeeding, $\delta_1\gamma_2$. Similarly, the vector of parameters $\tilde{\gamma}_2$ will be a combination of the

direct effect of the policies on breastfeeding, as well as its indirect effect through labour market participation.

Assuming that facilities to encourage breastfeeding at work have a positive direct impact on breastfeeding ($\gamma_2 > 0$), and that breastfeeding and employment status are negatively correlated ($\delta_1 < 0$), the estimated reduced-form parameters capturing the association between facilities and working will be a lower bound of the true effects of interest.

Both B_i^* and W_i^* are latent variables for which only the dichotomous variables W_i and B_i can be observed:

$$W_i = \begin{cases} 1 & if \quad W_i^* > 0 \\ 0 & otherwise \end{cases}, \qquad B_i = \begin{cases} 1 & if \quad B_i^* > 0 \\ 0 & otherwise \end{cases}. \tag{5}$$

Using this information, and further assuming that the error terms v_{1i} and v_{2i} follow a bivariate standard normal distribution:

$$\begin{pmatrix} v_{1i} \\ v_{2i} \end{pmatrix} \sim IIDN\left(\begin{bmatrix} 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 1 & \rho \\ \rho & 1 \end{bmatrix}\right), \tag{6}$$

leads us to estimate the model in (3)-(4) via a *bivariate probit* (Greene 1993).

5. Results

Our main set of results is presented in tables 4 and 5. Here we show estimates of bivariate probit models where the dependent variables are the probability of breastfeeding and being at work at 4 and 6 months, respectively. Given that the presence of breastfeeding facilities might be correlated with the availability of other workplace policies aimed at reconciling work and motherhood, we first estimate models in which only one type of facility or policy is included (panel A), and then a model in which we consider the availability of any breastfeeding facilities (either to express or breastfeed) and the availability of other workplace practices at the same time (panel B).

All models are first estimated on the entire sample of women, and then separately for higher and lower educated women. All the specifications control for characteristics of the mother and child, as well all the aspects of the job and firm we observe in our data (see table 2). The latter variables are particularly important in this context. Variables which control for job characteristics (such as the occupational code) and firm characteristics (such as the firm size) help us to account for other aspects of the job and the employer which might be associated with the presence or availability of breastfeeding facilities and family-friendly policies and therefore

help identifying the effects of interest. In addition, we also control for regional dummies and a full set of dummies measuring the level of deprivation of the area (17 Acorn groups).[9]

We start by looking at table 4, which presents the results for the dependent variables measured at 4 months. Looking at the effect of "facilities to express milk" (observed for 16% of the sample) on the probability of working, we see that there are no significant associations here, except in the sample of higher educated mothers where the coefficient is positive and statistically different from zero. By contrast, there is always a positive and very strong correlation between facilities to express milk and the probability of breastfeeding at 4 months. The second row of results considers "facilities to breastfeed", which are observed for 8.3% of mothers. Again, we find a positive and statistically significant association with mothers' labour market participation for higher educated women, but a weaker relationship with breastfeeding durations. These weaker results might be due to the fact that these types of facilities are relatively uncommon and require bringing the child to work which is probably not a feasible strategy for many women.

In the subsequent rows of panel A, we consider the effect of different types of family-friendly policies, including the availability of part-time, flexi-time, extended breaks, and shift patterns.[10] Here we find a strong and negative association between the availability of part-time and the probability of going back to work, which might reflect undesirable characteristics of the jobs (low level of control for example) which we are unable to capture in our vector of controls or could be a consequence of the fact that women with lower attachment to the labour force choose jobs with easy access to part-time. We also find a positive correlation between the availability of extended breaks and the probability of working at 4 months for higher educated women. The effects of this type of workplace policy on the probability of breastfeeding is however statistically insignificant.

In panel B of Table 4 we include in our specification the availability of any breastfeeding facilities (either to express milk or breastfeed) as well as the availability of other workplace policies.[11] What we intend to do here is to use the availability of other family-friendly policies at the workplace as implicit indicators of the characteristics of the job, rather than variables of interest per se. The idea is that if breastfeeding facilities are correlated with positive aspects of the job or the employer, controlling for other types of family-friendly policies should take this into account. As we can see, the positive association between breastfeeding facilities and mother's labour force participation is still statistically significant after the introduction of these

[9] Acorn is geo-demographic segmentation of the UK's population which segments small neighbourhoods, postcodes, or consumer households into 5 categories, 17 groups and 56 types. For more information on this classification, see: http://www.caci.co.uk/acorn-classification.aspx.

[10] We had some information on the availability of shorter hours, but we did not consider it as it was not clear how it differed from part-time work. The possibility of working at home was also included in the questionnaire, but its incidence so low (<5%) which we had to discard the possibility of analyzing it.

[11] We did not include separately "facilities to breastfeed" and "facilities to express milk", as they are highly correlated.

other controls. As in the previous panel, this is so only for more educated mothers. Similarly, we find again a positive association between breastfeeding facilities and breastfeeding durations is relevant for all women, irrespective of their level of education.

The table reports also the estimate of the *rho*, the correlation between the residuals. This is always negative, higher in magnitude among the more educated group, but always statistically insignificant. The latter result is due to the fact that there is a very small percentage of women who go back to work at 4 months (about 7%, as shown in table 2), so that most women are both not working and not breastfeeding (about 57% of the sample), while very few are at work and not breastfeeding (about 4.5%) at this point in time.

A much larger proportion of women – about 41% – is at work by the time the child is 6 months. Moreover, the minimum recommended duration of exclusive breastfeeding according to the World Health Organization is 6 months (World Health Assembly 2001). Therefore 6 months is an important point in time to consider. The results are presented in table 5, and show that the main findings are exactly the same as discussed for the 4 months threshold. The main exception here is that the association between the availability of "facilities to express milk" and mothers' working status is slightly less significant than at 4 months, although as we can see in panel B access to any breastfeeding facilities is still associated with mothers' return to work at the conventional level of significance. Also, we generally find no significant association between the availability of other family-friendly practices and either maternal labour supply or breastfeeding, with the exception of part-time work. Finally, the residual correlation between the probability to breastfeed and the probability to work, captured by the estimated *rho*, is now statistically significant and indicates clearly that the two processes are not independent of one another.

The coefficients in a limited dependent variable model model are useful only insofar as they give an idea of the sign and the level of statistical significance of the effect of interest. In order to consider the magnitude, it is necessary to take into account the distribution of the dependent variable. As we have two dependent variables in this case, several effects of interest could be considered, according to whether we want look at the joint, marginal or conditional probabilities.

Table 6 presents some of these calculations. In particular, we consider the effect of having access (vs. not having access) to any breastfeeding facilities on: (i) the marginal probability of working, (ii) the marginal probability of breastfeeding, (iii) the joint probability of working and breastfeeding, and (iv) the conditional probability of working given that breastfeeding takes place. We calculate these effects using the specification in panel B of tables 4 and 5, and setting the availability of all the other family friendly working practices to zero.

The first two rows of each panel reflect closely the results shown in the previous tables, in that the availability of breastfeeding facilities is found to affect the probability of working only among more educated women. The effect is of a 5 percentage increase in the probability of

working at 4 months and an 8 percentage increase in the probability of working at 6 months. By contrast, the effect of breastfeeding facilities on the probability to breastfeed is significant for all groups of women, and much larger in magnitude, about 16 to 19.5 percentage points. Here there is relatively little difference in the magnitude of the effect at 4 or 6 months, but some indication that the effect is larger for lower educated mothers. The third row reports the effects on the joint probability of breastfeeding and working, and is therefore a combination of the above effects.

The main aim of this paper is to consider whether the availability of facilities to breastfeed could be of benefit to employers in terms of, for example, an increase in labour force participation of mothers through shorter maternity leave spells. In statistical terms this means that we might want to look at how the conditional probability of working, given breastfeeding, is affected by the availability of breastfeeding facilities. This could be interpreted as the effect of breastfeeding facilities on the probability of working for those mothers who have a strong propensity to breastfeed. Table 6 therefore shows the effects of the availability of any breastfeeding facilities on this conditional probability at 4 and 6 months. We see that if a breastfeeding woman were offered facilities to breastfeed, the probability that she would be working at 4 months after birth would increase by 3.3 percentage points overall. For higher educated women this effect is about 4.8 percentage points, while there is no effect on lower educated women. At 6 months, making breastfeeding facilities available to all breastfeeding mothers is associated with an increase of 7.5 percentage points in their employment rate at 6 months, which is largely driven by an increase in the employment rate of higher educated mothers of almost 11 percentage points.

These effects are quite large in magnitude, but we need to remind ourselves that they capture an increase in the probability of working at 4 and 6 months for all those mothers who return to work by the time the child is 8-10 months. In other words, these effects are not indicative of an overall increase in the propensity to work, but simply of a reduction in the length of maternity leave. Even so, these are non-negligible effects, and suggest that providing breastfeeding facilities might be of benefit to employers, mothers and babies alike.

6. Endogeneity of workplace characteristics

One important issue we still need to address is the potential endogeneity of workplace characteristics, in particular of breastfeeding facilities. Women who have a high propensity to breastfeed might choose jobs with facilities that make it easier to continue breastfeeding while working at the same time. If this were the case, then our estimates of the impact of breastfeeding facilities on both breastfeeding and return to work would be biased upwards. More generally, if women with different propensities to breastfeed choose their jobs or employers on the basis of the workplace policies they offer, then the coefficients on the availability of these workplace policies (as well as all the other coefficients) in the model will be inconsistently estimated.

The IFS collects information about women's breastfeeding intention during pregnancy. The survey also asks whether the mother herself was breastfed as a child, and whether she is aware of the benefits of breastfeeding. All these variables are collected at stage 1, i.e. 4-6 weeks after birth, so well before we measure women's labour force working status or breastfeeding.[12] We consider these variables as proxies of a woman's propensity to breastfeed and examine their correlation with the availability of breastfeeding facilities or family-friendly policies at the workplace. If women with a higher propensity to breastfeed select jobs with different facilities and/or policies, then we would have some indication that we are facing a problem of endogeneity.

In table 7 we estimate probit models for the probability that a specific type of facility or policy is available as a function of the usual set of mother, child and area characteristics as well as a variable capturing the propensity to breastfeed. As for our main analysis, we present results for all women and for higher educated and lower educated women separately. As we can see by looking at the first two columns, there is no indication that women who intended to breastfeed, who were breastfed as a child, or who were aware of the benefits of breastfeeding are more likely to be in firms where breastfeeding facilities are available. The only exception is in panel C, where we see that lower educated mothers who were breastfed as a child have a higher probability of being in firms with "facilities to express milk".

The other columns present results for the other types of family-friendly policies we consider. Here we find some evidence that women who are aware of the benefits of breastfeeding are more likely to be found in firms who offer part-time, extended breaks and shift patterns. Among lower educated mothers, all women who intended to breastfeed are found to be in a firm which offers "extended breaks", so that the relevant coefficient is not identifiable in this case.[13]

Overall these results suggest that the availability of breastfeeding facilities is not likely to be endogenous in our model, while the presence of other family-friendly working practices might be. In particular, we are mainly concerned about the positive association between a woman's awareness of the benefits of breastfeeding and the presence of part-time opportunities, especially among higher educated mothers. This might explain why, for example, we find that the availability of part-time work reduces the probability that a mother is working at 4 and 6 months. As we have seen by comparing the results in panels A and B of tables 4 and 5, however,

[12] Ideally we would want to measure breastfeeding intentions and awareness of the benefits of breastfeeding before the birth of the child. This is because it is possible that the information collected at 4-6 weeks reflects actual breastfeeding behavior, rather than an underlying propensity to breastfeed. Unfortunately, the IFS does not collect information on pregnant women.

[13] In principle we should consider also variables which capture the propensity to work. Unfortunately, the IFS does not contain information about working intentions. However, as we focus here on mothers with a high propensity to work, selection of women into jobs with more family friendly policies on the basis of the propensity to participate to the labour force is less of a concern in our case.

including all other workplace practices in the model does not affect our estimates of the impact of breastfeeding facilities.

7. Conclusions

In this paper we analyse the role of breastfeeding facilities and other family-friendly working practices on the joint probability of working and breastfeeding. In particular, our main objective is to explore whether employers who facilitate breastfeeding at work through the provision of breastfeeding facilities or other family-friendly policies derive a benefit in terms of increased employment rates. Although these benefits are often thought to accrue to employers, and form part of the argument put forward by those who advocate workplace policies in support of breastfeeding, there is very little empirical evidence in support of these claims.

Using data from the 2005 UK Infant Feeding Survey on a sample of women who are working before their child is one year old, we find that the availability of breastfeeding facilities is associated with higher breastfeeding rates at 4 and 6 months after the birth of the child. By contrast, we do not find any significant positive association between breastfeeding and the availability of other family-friendly policies – such as part time, flexi time, extended breaks and shift patterns. Our main result, however, is that the availability of breastfeeding facilities is positively associated to the probability of working at 4 and 6 months after the birth of the child, resulting in a shorter duration of maternity leave. This is so only for highly educated women, while we do not find any significant association for the lower educated group of mothers.

We do not find that the availability of breastfeeding facilities is much greater among highly educated workers, and no indication that it is endogenous to breastfeeding intentions. There are therefore two other possible explanations for this finding. As higher educated mothers are much more likely to breastfeed for longer periods of time than lower educated mothers, the availability of breastfeeding facilities informs the decision to return to work for the former but not for the latter. Another possibility is that lower educated mothers have less choice in relation to the duration of their maternity leave, perhaps because of income considerations, and therefore the availability of breastfeeding facilities is likely to play a very marginal role on their decision to return to work despite its effect on breastfeeding rates.

As data on the availability of breastfeeding facilities and other family-friendly policies are only collected of women who return to work, our evidence is based on a sample of women with a very strong attachment to the labour force and we are not able to analyse other important outcomes, such as turnover rates and overall employment rates. Even so, our results support the claim that providing access to breastfeeding facilities benefits employers, as it results in significantly shorter maternity leave spells among higher educated mothers.

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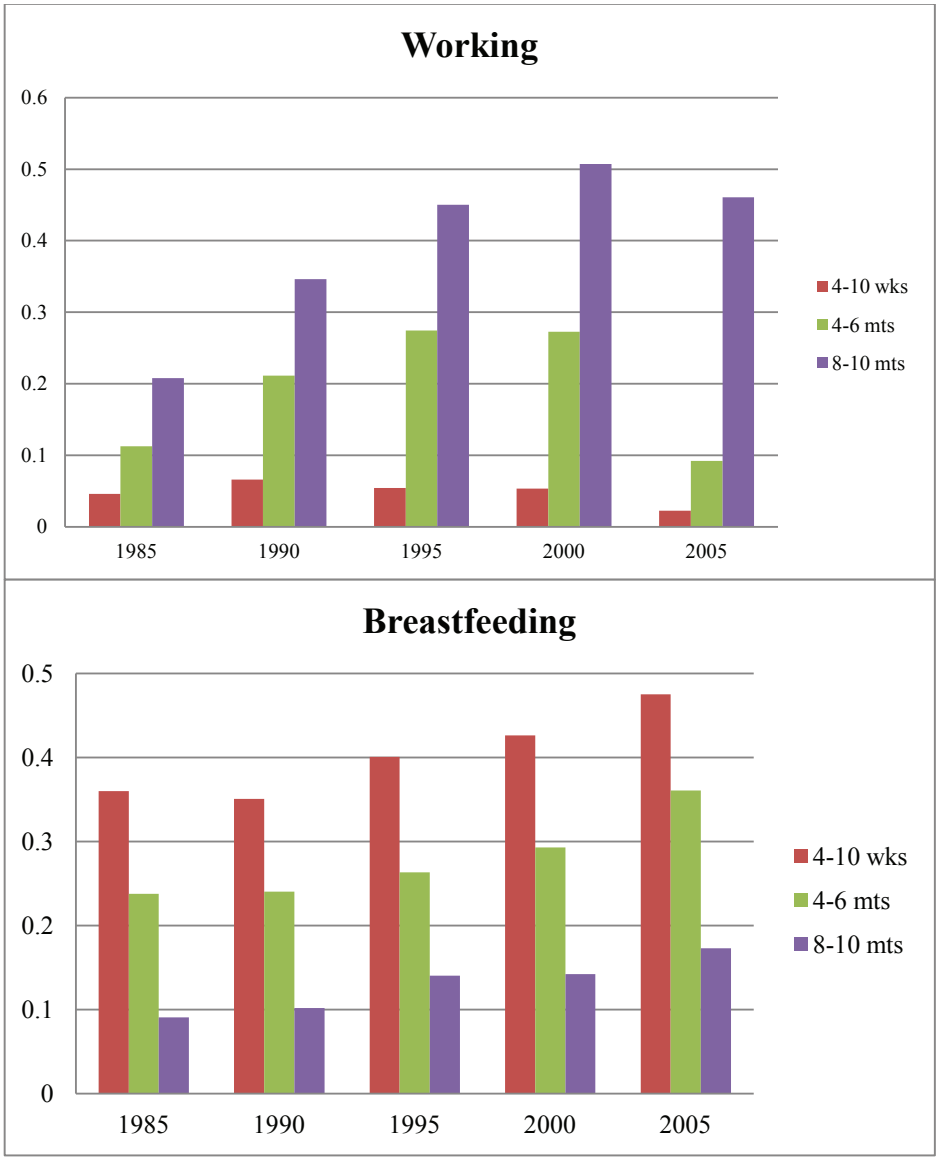
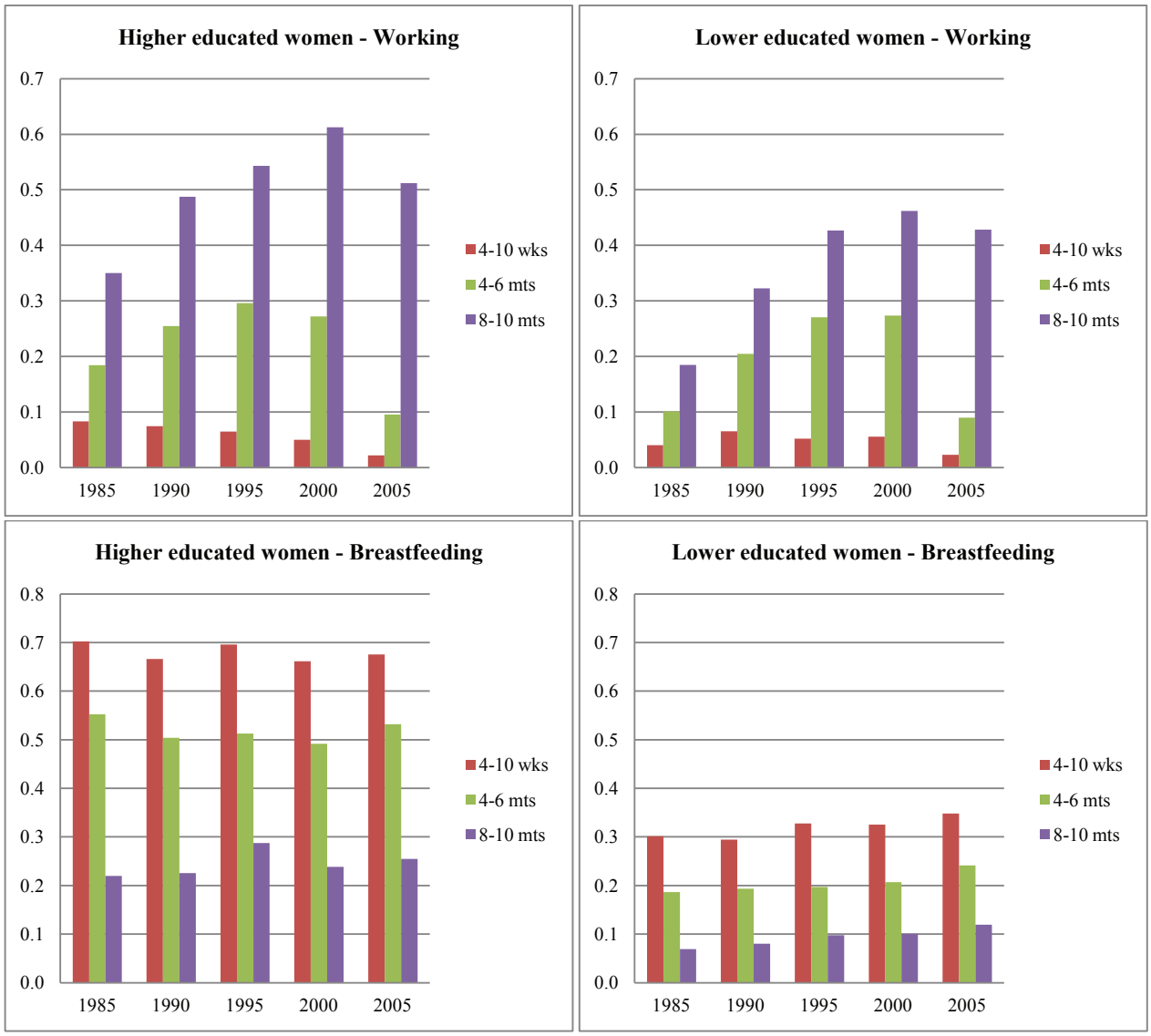
Figure 1: Percentage of women working or breastfeeding by age of the child and survey year, all women



Note: Data from the Infant Survey, years 1985 to 2005. Percentage of mothers working or breastfeeding recorded at stage one (4-10 weeks), stage two (4-6 months) and stage three (8-10 months). Data are weighted using survey and year specific weights. Data for 1985 exclude Northern Ireland.

Figure 2: Percentage of women working or breastfeeding by age of the child and survey year, high and lower educated women



Note: Data from the Infant Survey, years 1985 to 2005. Percentage of mothers working or breastfeeding recorded at stage one (4-10 weeks), stage two (4-6 months) and stage three (8-10 months). Data are weighted using survey and year specific weights. Data for 1985 exclude Northern Ireland.

Table 1: Information about the sample and selection process

Respondents at stage one	12,290	(a)
- Singletons	11,924	(b)
- Missing information on main maternal and child variables	11,728	(c)
- Have held a job in the past	10,876	(d)
- Respondents at stage three	8,494	(e)
- Working at stage three	4,359	(f)
- Employees at stage three	4,008	(g)
- Breastfed child for at least one day	3,094	(h)
- Sample (h) & lower educated	1,398	
- Sample (h) & higher educated	1,696	

Note: Data from the 2005 UK Infant Feeding Survey. Description of sample size and selection process. Unweighted number of observations shown.

Table 2: Descriptive statistics and analysis of selection process

Sample	(d)	(e)	(g)	(h)
Breastfeeding information and outcomes				
Breastfed child at least once	0.768	0.772	0.784	1.000
Breastfeeding at 4 months		0.340	0.293	0.373
Breastfeeding at 6 months		0.253	0.197	0.251
Work information and outcomes at stage three				
Working		0.488	1.000	1.000
On maternity leave		0.150	-	-
Not working		0.355	-	-
Missing working status		0.007	-	-
Working at 4 months		0.046	0.073	0.069
Working at 6 months		0.206	0.406	0.387
Workplace and job characteristics				
Firm size 1-24 employee			0.357	0.340
Firm size 25-499 employees			0.413	0.416
Firm size >=500 employees			0.223	0.235
Firm size missing			0.008	0.008
Manager and professional			0.103	0.112
Associate Professional			0.139	0.160
Administrative and secretarial			0.196	0.220
Skilled trades and personal services			0.202	0.195
Sales and customer services			0.152	0.147
Plant, machine and elementary operators			0.133	0.115
Missing occupational code			0.075	0.051
Workplace facilities and policies				
Facilities to express milk			0.135	0.160
Facilities to breastfeed			0.077	0.083
Facilities missing			0.071	0.062
Availability of part time			0.731	0.742
Availability of flexi time			0.338	0.348
Availability of extended breaks			0.059	0.064
Availability of shift patterns			0.228	0.220
Availability of policies missing			0.013	0.012
Mother characteristics				
Age <30	0.508	0.494	0.481	0.449
Age >=30	0.492	0.506	0.519	0.551
Lower educated (left ft education <19)	0.605	0.598	0.566	0.506
Higher educated (left ft education >=19)	0.395	0.402	0.434	0.494
Did not smoke in pregnancy	0.797	0.807	0.844	0.872
Smoke in pregnancy	0.176	0.166	0.129	0.102
Missing smoking in pregnancy	0.026	0.027	0.026	0.027
Married	0.569	0.587	0.628	0.640
Living with partner	0.276	0.271	0.292	0.277
Other marital status	0.128	0.117	0.082	0.067
Single	0.018	0.017	0.012	0.007
Missing marital status	0.009	0.009	0.006	0.007
Number of children	1.686	1.685	1.545	1.505
(standard deviation)	(0.871)	(0.874)	(0.748)	(0.716)

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Child and birth characteristics				
Age 30-38 weeks		0.153	0.136	0.126
Age 39-42 weeks		0.552	0.552	0.556
Age 43-46 weeks		0.225	0.235	0.245
Age >46 weeks		0.071	0.078	0.074
Firstborn	0.517	0.518	0.577	0.600
Birth weight <2.5kg	0.050	0.048	0.042	0.042
Birth weight 2.5-2.99kg	0.151	0.147	0.150	0.144
Birth weight 3.0-3.49kg	0.345	0.347	0.356	0.362
Birth weight >=3.50kg	0.454	0.458	0.453	0.452
Normal delivery	0.638	0.639	0.600	0.592
Forceps, vacuum delivery	0.129	0.132	0.153	0.158
Caesarean delivery	0.233	0.229	0.247	0.250
Observations	10,876	8,494	4,008	3,094

Note: Data from the 2005 UK Infant Feeding Survey. Distribution of different samples according to characteristics of the mothers, the children and the jobs. As most of the variables are binary indicators or categorical variables, only the weighted frequencies are reported. Where the variable is continuous (number of children), we report the weighted mean and the standard deviation. Weights are survey weights which take into account differences in the probability of selection for mothers in different countries, for mothers without partners and for differential non response at each stage of the survey.

Table 3: Differences between mothers according to education

	Higher educated women	Lower educated women	difference	test statistics	p-value
Panel A: respondents at stage three interview, sample (e)					
	freq.	*freq.*		χ^2	
Working	0.530	0.459			
On maternity leave	0.196	0.120			
Not working	0.268	0.413			
Missing working status	0.006	0.008		223.302	0.000
Observations	4,733	3,761			
Panel B: working as employees at stage three interview and breastfed for at least 1 day, sample (h)					
	mean	*mean*	*mean*	*t-stat.*	
Breastfeeding at 4 months	0.491	0.258	0.232	10.82	0.000
	(0.016)	(0.014)	(0.022)		
Breastfeeding at 6 months	0.329	0.174	0.155	8.04	0.000
	(0.015)	(0.012)	(0.019)		
Working at 4 months	0.060	0.078	-0.018	-1.49	0.137
	(0.008)	(0.009)	(0.012)		
Working at 6 months	0.347	0.426	-0.076	-3.48	0.001
	(0.023)	(0.017)	(0.022)		
Facilities to express milk	0.188	0.153	0.035	1.99	0.046
	(0.013)	(0.013)	(0.018)		
Facilities to breastfeed	0.092	0.085	0.007	0.49	0.622
	(0.009)	(0.010)	(0.013)		
Availability of part time	0.738	0.763	-0.025	-1.23	0.217
	(0.014)	(0.013)	(0.020)		
Availability of flexi-time	0.360	0.343	0.017	0.76	0.450
	(0.016)	(0.016)	(0.022)		
Availability of extended breaks	0.065	0.064	-0.001	-0.10	0.920
	(0.008)	(0.008)	(0.012)		
Availability of shift patterns	0.189	0.255	-0.066	-3.28	0.001
	(0.013)	(0.015)	(0.020)		
Observations	1,696	1,398			

Note: Data from the 2005 UK Infant Feeding Survey. Differences in the distribution of outcome variables and variables capturing the availability of facilities and family friendly policies according to mothers' education. Panel A shows difference in mothers' labour market status at stage three and reports a χ^2 test with 3 degrees of freedom. Panel B reports means (standard errors) and differences in duration of breastfeeding and maternity leave by level of education for the sample of mothers who work as employees at stage three and have breastfed for at least one day. A t-test of the difference in means is provided with associated level of significance. When looking at facilities and family friendly policies we restrict the sample to non-missing observations on these variables. Data are weighted using survey weights (see notes to table 2).

Table 4: Effects of facilities to breastfeed and family-friendly policies on the probability to breastfeed and the probability to be at work at 4 months

	All women		Higher educated women		Lower educated women	
	work at 4m	bf. at 4m	work at 4m	bf. at 4m	work at 4m	bf. at 4m
Panel A: Each type of facility or policy considered in separate models						
Facilities to express milk	0.180	0.460**	0.407*	0.408**	-0.004	0.552**
	(0.121)	(0.085)	(0.161)	(0.111)	(0.190)	(0.129)
Rho	*-0.074(0.063)*		*-0.130 (0.081)*		*-0.018(0.087)*	
Facilities to breastfeed	0.268+	0.195+	0.493*	0.155	-0.090	0.210
	(0.145)	(0.104)	(0.201)	(0.142)	(0.210)	(0.153)
Rho	*-0.070(0.062)*		*-0.126(0.082)*		*-0.012(0.086)*	
Availability of part time	-0.458**	-0.007	-0.580**	0.119	-0.434**	-0.187+
	(0.102)	(0.073)	(0.143)	(0.095)	(0.141)	(0.110)
Rho	*-0.067(0.063)*		*-0.120(0.081)*		*-0.039(0.088)*	
Availability of flexi-time	0.179+	0.032	0.114	-0.021	0.237+	0.029
	(0.099)	(0.066)	(0.148)	(0.089)	(0.126)	(0.099)
Rho	*-0.073(0.063)*		*-0.128(0.081)*		*-0.035(0.087)*	
Availability of extended breaks	0.326+	0.050	0.597**	-0.066	-0.042	0.125
	(0.169)	(0.125)	(0.205)	(0.173)	(0.266)	(0.185)
Rho	*-0.075(0.062)*		*-0.136(0.081)*		*-0.035(0.087)*	
Availability of shift patterns	0.154	-0.059	0.383*	0.023	0.006	-0.122
	(0.114)	(0.079)	(0.172)	(0.113)	(0.148)	(0.114)
Rho	*-0.068(0.063)*		*-0.122(0.082)*		*-0.033(0.087)*	
Panel B: All facilities and policies considered in the same model						
Any breastfeeding facilities	0.221+	0.517**	0.390*	0.451**	0.058	0.651**
	(0.120)	(0.083)	(0.168)	(0.111)	(0.178)	(0.123)
Availability of part time	-0.514**	-0.020	-0.677**	0.113	-0.468**	-0.216*
	(0.103)	(0.073)	(0.148)	(0.096)	(0.142)	(0.110)
Availability of flexi-time	0.171	0.011	0.004	-0.035	0.271*	0.023
	(0.105)	(0.070)	(0.165)	(0.095)	(0.135)	(0.104)
Availability of extended breaks	0.243	-0.056	0.492*	-0.188	-0.058	0.076
	(0.180)	(0.131)	(0.231)	(0.185)	(0.284)	(0.196)
Availability of shift patterns	0.147	-0.078	0.374*	0.015	0.034	-0.177
	(0.121)	(0.083)	(0.181)	(0.117)	(0.160)	(0.121)
Rho	*-0.089(0.065)*		*-0.126(0.084)*		*-0.054(0.090)*	
Observations	3,094		1,696		1,398	

Note: Data from the 2005 UK Infant Feeding Survey. Bivariate probit model estimated through Maximum Likelihood. Dependent variables are: probability to be at work and probability to be breastfeeding at 4 months. Panel A reports results from separate models in which only one type of facility or policy is included. Panel B reports results from a single model in which the availability of any breastfeeding facilities and of all the family-friendly policies are included at the same time. All models control for the set of maternal, child and work characteristics reported in table 2, as well as a complete set of regional dummies and dummies derived from an index of local area deprivation (Acorn). Coefficients and heteroskedasticity-robust standard errors (in parentheses) shown. Estimation takes into account survey weights (see notes to table 2). Symbols: + significant at 10% level, * significant at 5% level, ** significant at 1% level.

Table 5: Effects of facilities to breastfeed and family-friendly policies on the probability to breastfeed and the probability to be at work at 6 months

	All women		Higher educated women		Lower educated women	
	work at 6m	bf. at 6m	work at 6m	bf. at 6m	work at 6m	bf. at 6m
Panel A: Each type of facility or policy considered in separate models						
Facilities to express milk	0.118	0.526**	0.204+	0.486**	-0.040	0.656**
	(0.083)	(0.084)	(0.106)	(0.108)	(0.130)	(0.135)
Rho	*-0.250**(0.039)*		*-0.260**(0.052)*		*-0.279**(0.059)*	
Facilities to breastfeed	0.217*	0.269*	0.454**	0.234	-0.059	0.302+
	(0.107)	(0.107)	(0.134)	(0.139)	(0.155)	(0.163)
Rho	*-0.241**(0.039)*		*-0.248**(0.052)*		*-0.280**(0.063)*	
Availability of part time	-0.267**	0.005	-0.386**	0.133	-0.197+	-0.164
	(0.072)	(0.077)	(0.096)	(0.100)	(0.109)	(0.120)
Rho	*-0.239**(0.039)*		*-0.233**(0.053)*		*-0.283**(0.056)*	
Availability of flexi-time	0.066	0.045	0.085	0.068	0.020	-0.015
	(0.066)	(0.070)	(0.091)	(0.092)	(0.096)	(0.109)
Rho	*-0.237**(0.039)*		*-0.241**(0.052)*		*-0.273**(0.058)*	
Availability of extended breaks	0.165	0.230+	0.109	0.135	0.224	0.273
	(0.123)	(0.127)	(0.162)	(0.172)	(0.179)	(0.190)
Rho	*-0.240**(0.039)*		*-0.241**(0.052)*		*-0.280**(0.058)*	
Availability of shift patterns	0.069	-0.066	0.067	0.086	0.092	-0.226+
	(0.077)	(0.082)	(0.115)	(0.114)	(0.105)	(0.122)
Rho	*-0.235**(0.039)*		*-0.239**(0.052)*		*-0.270**(0.058)*	
Panel B: All facilities and policies considered in the same model						
Any breastfeeding facilities	0.101	0.592**	0.221*	0.537**	-0.080	0.790**
	(0.080)	(0.082)	(0.105)	(0.108)	(0.122)	(0.130)
Availability of part time	-0.285**	-0.014	-0.409**	0.112	-0.211+	-0.202+
	(0.072)	(0.077)	(0.096)	(0.100)	(0.110)	(0.120)
Availability of flexi-time	0.058	-0.006	0.083	0.023	0.007	-0.049
	(0.068)	(0.075)	(0.096)	(0.099)	(0.099)	(0.118)
Availability of extended breaks	0.137	0.130	0.031	-0.041	0.256	0.299
	(0.130)	(0.136)	(0.178)	(0.188)	(0.186)	(0.206)
Availability of shift patterns	0.058	-0.116	0.091	0.053	0.068	-0.343**
	(0.080)	(0.086)	(0.119)	(0.119)	(0.109)	(0.129)
Rho	*-0.267**(0.042)*		*-0.270**(0.057)*		*-0.314**(0.064)*	
Observations	3,094		1,696		1,398	

Note: Data from the 2005 UK Infant Feeding Survey. Bivariate probit model estimated through Maximum Likelihood. Dependent variables are: probability to be at work and probability to be breastfeeding at 6 months. Panel A reports results from separate models in which only one type of facility or policy is included. Panel B reports results from a single model in which the availability of any breastfeeding facilities and all the family-friendly policies are included at the same time. All models control for the set of maternal, child and work characteristics reported in table 2, as well as a complete set of regional dummies and dummies derived from an index of local area deprivation (Acorn). Coefficients and heteroskedasticity-robust standard errors (in parentheses) shown. Estimation takes into account survey weights (see notes to table 2). Symbols: + significant at 10% level, * significant at 5% level, ** significant at 1% level.

Table 6: Marginal effects of having access to any breastfeeding facilities

	All women	Higher educated women	Lower educated women
Panel A: Effects at 4 months			
Prob(working=1)	0.033+	0.050*	0.009
	(0.018)	(0.024)	(0.028)
Prob(breastfeeding=1)	0.169**	0.161**	0.195**
	(0.027)	(0.039)	(0.037)
Prob(working=1, breastfeeding=1)	0.026*	0.035*	0.022*
	(0.008)	(0.012)	(0.010)
Prob(working=1|breastfeeding=1)	0.033*	0.048*	0.012
	(0.017)	(0.022)	(0.026)
Panel B: Effects at 6 months			
Prob(working=1)	0.038	0.080*	-0.029
	(0.030)	(0.038)	(0.045)
Prob(breastfeeding=1)	0.168**	0.167**	0.194**
	(0.024)	(0.034)	(0.034)
Prob(working=1, breastfeeding=1)	0.073**	0.088**	0.068**
	(0.012)	(0.017)	(0.017)
Prob(working=1|breastfeeding=1)	0.075*	0.109*	0.035
	(0.028)	(0.035)	(0.042)
Observations	3,094	1,696	1,398

Note: Data from the 2005 UK Infant Feeding Survey. Marginal effect of the availability of any breastfeeding facilities on the marginal, joint and conditional probabilities of working and breastfeeding. All other family-friendly policies are set to be zero for these calculations. The effects are estimated using the models presented in panel B of tables 4 and 5. Estimation takes into account survey weights (see notes to table 2). Symbols: + significant at 10% level, * significant at 5% level, ** significant at 1% level.

Table 7: Endogeneity of breastfeeding facilities and family-friendly policies

	Facilities to express milk	Facilities to breastfeed	Availability of part time	Availability of flexi time	Availability of extended breaks	Availability of shift patterns	N
Panel A: All women							
Intended to bf.	0.037	-0.155	-0.290	-0.071	0.962**	-0.264	2893
	(0.295)	(0.274)	(0.243)	(0.195)	(0.311)	(0.221)	
Mother bfed	0.084	0.012	0.010	0.089	0.028	-0.034	2877
as a child	(0.075)	(0.089)	(0.070)	(0.066)	(0.097)	(0.073)	
Benef. of bf.	0.184	0.211	0.319*	0.055	0.576*	0.360*	3062
	(0.178)	(0.205)	(0.147)	(0.145)	(0.261)	(0.163)	
Panel B: Higher educated women							
Intended to bf.	0.069	-0.491	-0.168	-0.276	0.431	0.254	1600
	(0.441)	(0.351)	(0.393)	(0.361)	(0.394)	(0.367)	
Mother bfed	-0.056	-0.062	-0.022	0.062	-0.044	-0.144	1591
as a child	(0.099)	(0.118)	(0.092)	(0.090)	(0.126)	(0.102)	
Benef. of bf.	0.296	-0.136	0.621*	0.057	-0.010	0.836**	1681
	(0.287)	(0.310)	(0.246)	(0.245)	(0.346)	(0.283)	
Panel C: Lower educated women							
Intended to bf.	0.038	0.113	-0.253	0.112	-	-0.371	1283
	(0.411)	(0.432)	(0.302)	(0.249)		(0.279)	
Mother bfed	0.249*	0.074	0.058	0.127	0.159	0.057	1266
as a child	(0.117)	(0.135)	(0.105)	(0.099)	(0.138)	(0.102)	
Benef. of bf.	0.059	0.359	0.201	0.053	1.315**	0.234	1372
	(0.225)	(0.266)	(0.182)	(0.186)	(0.398)	(0.202)	

Note: Data from the 2005 UK Infant Feeding Survey. Probit model estimated through Maximum Likelihood. Dependent variables are: probability to have acces to facilities to express milk, probability to have access to facilities to breastfeed, probability to have access to part time, flexi time, extended breaks and shift work. Main independent variable of interest: whether the mother had intended to breastfeed the child, whether she was breastfed as a child, whether she was aware of the benefits of breastfeeding (all measured at stage 0ne). Each coefficient represents the result of a separate regression. Panel A refers to all women, while panels B and C refer to higher educated and lower educated women, respectively. All models control for the set of maternal, child and work characteristics reported in table 2, as well as a complete set of regional dummies and dummies derived from an index of local area deprivation (Acorn). Coefficients and heteroskedasticity-robust standard errors (in parentheses) shown. Estimation takes into account survey weights (see notes to table 2). Symbols: + significant at 10% level, * significant at 5% level, ** significant at 1% level.