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Newborns and new schools: critical times in women's employment

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Abbreviations

ALSPAC	Avon Longitudinal Study of Parents and Children
AML	Additional Maternity Leave
BHPS	British Household Panel Survey
DWP	Department for Work and Pensions
FACS	Families and Children Study
MA	Maternity Allowance
MRC	Medical Research Council's National Survey of Health Development
NCDS	National Child Development Study
NLS	National Longitudinal Survey
NLSY	National Longitudinal Survey of Youth
OML	Ordinary Maternity Leave
PSI	Policy Studies Institute
SMP	Statutory Maternity Pay
WES	Women in Employment Study

Summary

This report investigates how and when differences in work behaviour between men and women develop, focusing on the evolution of the gender gaps immediately after childbirth and during the initial years of family development. There are many competing theories that seek to explain gender differences in employment roles, but the viewpoint put forward here is that gender differences in the formal labour market stem from the division of parental duties between mothers and fathers in the home, with mothers being primarily responsible for the care of children.

The analysis presented here focuses on two crucial periods in family development: when a new baby arrives and when a child starts school. Newborns clearly affect women's work opportunities and choices: the need to provide care for the child and the additional domestic responsibilities raise the opportunity costs of working and, more controversially, may reduce the woman's productivity as a formal worker. However, the effect of a child starting school has received less attention as an important turning point, in spite of the fact that both academic research and government policy have consistently made the distinction by considering mothers with pre-school children as a separate entity from those with only school children. While school entry at age four or five presents a substantial sudden change in circumstances through the provision of what is effectively free (and compulsory) childcare which may enhance work opportunities for mothers, it also comes with additional parental demands associated with school life and the complexities of organising care around normal school hours. There is a presumption underlying policy discussion that mothers' work opportunities are **suddenly** improved once their youngest child starts school, but there is little concrete evidence that work outcomes change dramatically at this point. As well as considering how participation in paid work alters for women around these critical times, the analysis considers how employment conditions, including the relative wage rate, develop at these points. In particular, it is important to assess whether women's overall labour market position is weakened relative to men around these crucial times or whether there are compensating changes between different types of work characteristics.

This study uses two data sources: the first 13 waves from the British Household Panel Survey (BHPS), covering the years 1991 to 2003, and the first five waves from the Families and Children Study (FACS), covering the years 1999 to 2003. Information on all adults from the BHPS is combined with data on families from the FACS to create a large sample of families, which is used in the specific analysis of newborns and school entry, and a comparison sample containing individuals over all stages of the lifetime, including before, throughout and after family formation.

Previous work in this area has focused on the impact of birth on women's work behaviour and the length of absence from work for mothers following birth. More recent cohorts of mothers in Britain are returning to employment more quickly following childbirth, are more likely to return between births and are more likely to be in employment subsequent to childbirth than older generations. The evidence also shows that the length of absence is related to the number of children in the family, the mother's age, education and partnership, the mother's wage level, occupation and sector of work, employer tenure and unearned income. Those qualifying for maternity leave have also be shown to return more quickly, while shorter interruptions in employment following childbirth and using maternity leave have also been associated with a smaller wage penalty for having children. There is very limited evidence on the impact of childbirth on other employment characteristics.

This report makes several advances over previous research in this area: First, although the impacts of childbirth on women's employment have been the subject of several studies, as far as we are aware, changes in mothers' employment around the time of school entry have not previously been examined. Second, much of the work on childbirth relies on data that are now quite dated. Third, by using panel data, the study examines how work characteristics alter for individual women without the potential participation biases present in aggregate statistics. Fourth, using annual panel interviews allows changes to be closely mapped over the critical times without the need to rely on recalled information. Finally, the analysis uses two types of control groups to calibrate whether the changes observed at the critical times are normal labour market dynamics. The first consists of women at other times in family formation and development. The second consists of men at the same critical points, the use of whom controls for possible trends in wages and other employment characteristics that coincide with the arrival of children.

The results presented here are broadly consistent with the view that newborns and new schools are critical times in women's employment. While births, and particularly first births, clearly mark a dramatic change in participation in work for women, school entry is also a critical time of considerable turnover in participation, marking both the last years of unusually high rates of exit from work for mothers and the first years of unusually high rates of entry into work. The impact of these critical times on wages is more subtle: the gradual decline in women's relative wages appears to stem from the accumulation of several shorter periods of unusually low wage growth for women around the times of birth and school entry. Important changes in other work characteristics also occur around the critical times, particularly the sharp

movement into part-time work following birth and the general transitions towards non-permanent positions and non-supervisory roles at both critical points.

The theory that gender differences in the formal labour market stem from the division of parental duties between mothers and fathers in the home is supported by many of the findings. In particular, there is a distinct point of divergence in men's and women's work behaviour when children are born and there is a very clear persistence of gender discrepancies even after children have grown up or left home. However, the years prior to the arrival of children are also marked by some distinct gender differences, particularly in the wage and hours of work. Yet the magnitudes of these differences are of a much smaller order than those in the presence of children, suggesting that they either represent anticipatory effects of the impact of children or are driven by other factors of much less relevance.

Although primarily aiming to be descriptive of the current situation rather than deriving specific policy recommendations, the analysis in this report has given rise to several findings that are relevant to policy discussion or are particularly worthy of further investigation given their potential policy relevance. In particular, these include:

- focusing on the presence of children as the source of gender inequalities in the labour market;
- considering a broader range of work characteristics beyond participation and wages in analysing gender differences in the labour market;
- noting that existing maternity leave and pay policies have achieved their objectives, at least to some extent;
- understanding the interactions between maternity leave and maternity pay policies;
- considering the longer-term, potentially negative impacts of maternity policies that encourage women to take longer absences following birth;
- exploring the possibility of creating additional incentives for women to return to work between births as a means to hasten their return to work after subsequent births;
- focusing not just on encouraging women to return to work following the birth, but also on ensuring that they remain in work;
- reassessing the presumption that mothers should be able to undertake formal paid work once their youngest child starts school;
- noting that enhancing family income through maternity pay or other tax credits may encourage mothers to remain absent from work for longer;
- investigating why women working in the public sector return more quickly to work following birth;
- continuing to target help in undertaking employment towards lone mothers;

- investigating why non-white mothers remain absent from work for longer than white mothers; and
- in supporting different types of childcare, taking note that nannies, mother's helps and childminders are currently of greater help than school clubs to families with children entering school.

1 Introduction

This report investigates how and when differences in work behaviour between men and women develop, focusing on the evolution of the gender gaps immediately after childbirth and during the initial years of family development. The gender differences are most marked for women with children, suggesting that the root cause of gender inequality in the labour market may lie in the compromises in work choices made by mothers when balancing family and work needs. However, cross-sectional data cannot tell whether the differences in average employment characteristics reflect real changes in behaviour by individuals when they become parents, or whether they are a consequence of changes in the sort of women who work when they become parents, altering the average employment characteristics of working mothers.[1] Furthermore, where there are genuine changes in individuals' employment circumstances as women move from being a childless female worker to a working mother, cross-sectional data cannot tell us how quickly or smoothly the transition occurs. By using panel data from two large surveys, the analysis presented here is able to address these issues for the first time.

The work focuses on two crucial periods in family development: when a new baby arrives and when a child starts school. Newborns clearly affect women's employment opportunities and choices: the need to provide care for the child and the additional domestic responsibilities raise the opportunity costs of working and, more controversially, may reduce the woman's productivity as a formal worker. However, the effect of a child starting school has received less attention as an important turning point, in spite of the fact that both academic research and government policy have consistently made the distinction by considering mothers with pre-school children as a separate entity from those with only school children. While school entry at age four or five presents a substantial sudden change in circumstances

[1] The terms 'work' and 'employment' are used in this report to refer to formal paid work, with the usual caveat that this does not imply that those not in 'work' or 'employment' are not working or gainfully employed in home and family responsibilities. The term 'employment' has also been loosely applied to mean both employment with an employer and self-employment, other than where it is clear that a distinction is being made between the two.

through the provision of what is effectively free (and compulsory) childcare which may enhance employment opportunities for mothers, it also comes with additional parental demands associated with school life and the complexities of organising care around normal school hours. There is a presumption underlying policy discussion that mothers' employment opportunities are **suddenly** improved once their youngest child starts school, but there is little concrete evidence that employment outcomes change substantially at this point. As well as considering how participation in paid work alters for women around these critical times, the analysis considers how employment conditions, including the relative wage rate, develop at these points. In particular, it is important to assess whether women's overall labour market position is weakened relative to men around these crucial times or whether there are compensating changes between different types of work characteristics.

This report makes several advances over previous research in this area: First, although the impacts of childbirth on women's employment have been the subject of several studies, as far as we are aware, changes in mothers' employment around the time of school entry have not previously been examined. Second, much of the work on childbirth, even some recently published research, relies on data that are now quite dated and may not reliably reflect the current situation, especially in light of the rapid developments in mothers' employment behaviour and recent related policy innovations.[2] Third, as already highlighted, by using panel data, the study examines how work characteristics alter for individual women without the potential participation biases present in aggregate statistics. There is an important caveat that changes are only measured for those who remain in employment or who return to employment within the life of the panel, but an accurate account can be provided for this sample. Fourth, using annual panel interviews also allows changes to be closely mapped over the critical times without the need to rely on recalled information. Finally, the analysis uses two types of control groups to calibrate whether the changes observed at the critical times are normal labour market dynamics. The first consists of women at other times in family formation and development. The second consists of men at the same critical points, the use of whom controls for possible trends in wages and other employment characteristics that coincide with the arrival of children.

The report is organised as follows: The next chapter briefly discusses the theory underlying the hypothesis that childbirth and school entry may be critical times in women's employment, while Chapter 3 presents a review of the previous literature in this area. Chapter 4 describes the data sources and the samples used in the analysis. The following three chapters present the bulk of the analysis.

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[2] Recent related policy innovations include the changes in tax credits affecting families, the subsidies for formal childcare (nursery grants, National Insurance allowances and the childcare element in the tax credits) and the changes in statutory maternity leave entitlements and maternity pay policy.

Chapter 5 considers the effect of children on women's participation in paid work, beginning with a broad picture of the gender differences for those with and without children. The analysis of women's employment following childbirth is then divided into three sections examining (a) the length of absence from work following childbirth (Section 5.2), (b) maternity rights over the period and their impact on how soon women return to work (Section 5.3) and (c) the permanency of return to work following childbirth and interruptions by subsequent births (Section 5.4). Section 5.5 investigates changes in women's work participation around the time of school entry. Section 5.6 addresses the question of whether newborns and new schools are critical times in women's employment participation by comparing changes in employment participation around these times with changes at other times for women and with changes for men at the same stages in family formation. A summary of participation in paid work is presented in Section 5.7.

An analysis of the impact of children on the gender wage gap is presented in Chapter 6. The first section describes differences in the gender wage gap between the broad groups of those with and those without children and analyses how much of the gender wage gap can be attributed to observable characteristics in each case. Section 6.2 compares wage growth for women at the critical points of birth and school entry with changes at other times for women and with changes at the same stages for men. Sections 6.3 and 6.4 focus on wage growth around the time of birth and around the time of school entry respectively, focusing on which types of mothers are most likely to be affected by either event. Section 6.3 also considers whether maternity rights have any impact on wage growth in the case of newborns. Section 6.5 summarises the findings on the gender wage gap.

Gender differences in other employment characteristics are examined in Chapter 7, again beginning with a broad comparison between those without children and those with children (Section 7.1). Section 7.2 considers changes in these characteristics over the critical periods and draws comparisons with changes at other times for women and at the same stages for men. Sections 7.3 and 7.4 analyse the relationships between the changes and demographic factors for the newborns and new schools samples respectively. Section 7.3 also considers the impact of entitlements to maternity pay and leave on the changes in these employment characteristics. Section 7.5 summarises the findings of this chapter.

Chapter 8 considers changes in childcare use and type around the time of school entry. Section 8.1 compares changes in the type of care and in childcare spending around the time of school entry with those for pre-school children and primary-school children. The impact of pre-school childcare choices on mothers' future employment after school entry is considered in Section 8.2, while Section 8.3 summarises the findings on childcare.

The final chapter draws together the findings and addresses the question of whether and in what way newborns and new schools are critical times in women's employment, highlighting how these conclusions might affect future policy discussions. We should emphasise that this report does not seek to pass judgement

on whether it is desirable to influence choices made by parents about paid work and childcare. For example, it might be argued that maintaining the mother's employment may be in the best interests of aiding both the current and future financial stability of the family. On the other hand, providing financial support for the mother to be the prime carer for young children might be argued to be in the best interests of the family's welfare. The purpose of this work is to show how employment choices are currently affected by children, not to advocate how they should be influenced.

2 Why might newborns and new schools be critical times more quickly for women?

There are many competing theories that seek to explain gender differences in employment roles, including discrimination within the market; inherent differences in productivity between male and female workers; gender differences in educational and training choices prior to labour market entry; inherent gender differences in preferences over employment choices; different social norms concerning employment roles for men and women (beyond the parenting role); and unequal division of household responsibilities in the absence of children. But the viewpoint put forward in this report is that gender differences in the formal labour market stem from the division of parental duties between mothers and fathers in the home, with mothers being primarily responsible for the care of children.

The ways in which an unequal division of parental responsibilities between mothers and fathers translate into differences in the relative position of men and women in the labour market have been widely discussed. Children may reduce their mother's propensity to work because of the costs of alternative childcare, and through the additional home responsibilities that make time at home more valuable relative to a wage. On the other hand, children are expensive and so may increase the likelihood of both mother and father working to raise additional income. Additional home responsibilities may reduce the mother's actual or perceived productivity while at work, affecting the wage that the mother can earn. Children may alter the mother's preferences across different types of employment characteristics by, for example, creating preferences for greater flexibility or more conveniently located work.

The impact of children on mothers' employment may depend on the age of the child, as the costs of alternative childcare and parental demands may alter as the child ages. The most dramatic change is when a child starts school, with the sudden provision of 'free' childcare during school hours, which, according to standard models of labour supply, should encourage mothers to enter work or to extend their

hours by reducing the average cost of care. Yet reality may not be so simple: suitable childcare to cover the remaining hours may not always be available or may create too many complexities in differing and irregular arrangements.[3] In addition, a child starting school brings a new involvement in school life for the parent as well as the child, potentially generating new responsibilities for the mother outside the formal labour market.

With a purely static model, our preferred theory leads to predictions that are in stark contrast to those derived from alternative hypotheses on the source of gender differences in the labour market. In particular, it suggests that there should be no gender differences in employment if there are no children present. It also predicts that the employment choices of women may depend upon the age and number of children, with possibly distinct differences between pre-school and school-age children. In a completely static framework, there would be a very marked change in women's employment behaviour at childbirth, which would gradually converge back to men's employment behaviour as the children aged (with possible discrete changes at school entry). Hence, observation of gender differences in the labour market over the entire path of family formation should provide a clear-cut test of the validity of this theory.

However, the real world does not operate as a series of purely static models, and a more dynamic framework is required. In particular, women and employers may anticipate future changes. For example, women may invest less in their education or training if they anticipate being absent from work for a number of years. Or employers may be more reluctant to hire women if they believe they will lose them in a few years to maternity leave. On the other hand, women may be slow to adjust to new circumstances, particularly in the absence of good information. Some may initially return to work following childbirth, only to find it not the best choice, while it may take time for others to adjust their employment characteristics through job moves.[4] Most importantly, the changes in employment choices made by women when they have children may have long-term effects, persisting even once their children have left home. In particular, the loss of employment experience and training after having children may leave women in a permanently weaker labour market position relative to men. Once dynamics are added to the model, the predictions for gender differences in employment are no longer so clear cut: gender differences can exist even in the absence of children, even though they stem from the presence of children.

This theory that gender differences in the formal labour market stem from the division of parental duties between mothers and fathers in the home, leads to three main predictions: first, that there is little difference between men and women's work behaviour for those who are not and have not been parents; second, that there is a distinct point of divergence in men's and women's employment behaviour when children are born; and finally, that there may be persistence of gender discrepancies after children have grown up or left home.

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[3] For example, see Skinner (2003).

[4] For example, see Blundell *et al.* (2005).

3 Previous literature

Previous research has shown that more recent cohorts of mothers in Britain are returning more quickly to employment following childbirth, are more likely to return between births and are more likely to be in employment subsequent to childbirth than older generations. The evidence also shows that some types of mothers tend to return sooner than others: younger mothers; the more educated; those with higher wages, in higher-level occupations or working in the public sector; those with longer employer tenure; those with lower unearned income; and those with more children. However, there are conflicting findings across studies on the impact of the presence of a partner. Those qualifying for maternity leave also tend to return more quickly, even allowing for possible differences in observed characteristics and unobserved differences in labour market attachment. The same types of factors are also related to the propensity to return to full-time rather than part-time work and to remain in employment once returned. Shorter interruptions in employment following childbirth and using maternity leave are also associated with a smaller wage penalty for having children. There is very limited evidence on the impact of childbirth on other employment characteristics.

3.1 Women in the labour market

Much of the research on women's formal employment in the labour market has been conducted in the context of their position relative to men. Historically, the focus has been on understanding why female workers command lower hourly wages on average than their male counterparts and the possibility that Government intervention might be required to address this 'problem' of the gender wage gap. A summary of this work can be found in Anderson *et al.* (2001) or Joshi and Paci (1998, 32–34) for Britain and in Blau (1998, section III) for the United States (US). International comparisons of the gender wage gap are provided in Blau and Kahn (1996, 2000) and Grimshaw and Rubery (2001).

Increasingly, however, research attention has turned towards examining gender differences in the participation in paid work, partly as a means to understanding the gender wage gap, but also from a broader interest in the economics of the family. In particular, the impact of children on work choices and the division of responsibilities

for raising children between mothers and fathers have featured heavily in research and policy discussion, both for reasons related to gender equality and because of concerns about how these decisions affect family well-being. The effects of motherhood on women's employment and wages has been documented in studies such as Joshi *et al.* (1999), Joshi (2002) and Paull and Taylor (2002) for Britain and Waldfogel (1997a, 1998a) and Anderson *et al.* (2002) for the US. An international comparison for seven industrialised countries is provided in Harkness and Waldfogel (1999). The findings of these studies indicate that the 'family gap' – that is, the differences in work behaviour between women without children and mothers – may be more important than the gender gap alone, vindicating research emphasis on analysing the role of family formation in understanding the gender differences. Further research has attempted to establish how the presence of children and the work behaviour of mothers relate to each other and the direction of influence between the two.[5]

The effect of childbirth on women's employment and wages has been the subject of several studies, partly motivated by interest in the effectiveness of maternity rights legislation. A summary of these publications is provided in the remainder of this chapter. As far as we are aware, however, there has been no work considering whether other periods in family formation are also particularly influential on mothers' employment, including when a child starts compulsory schooling at the age of four or five.

3.2 Women's employment following childbirth

Much of the research on the impact of childbirth in Britain has focused on how quickly mothers return to formal paid employment and, to a lesser degree, on whether they remain in employment. One important data source for this analysis has been the cohort studies, including the Medical Research Council's (MRC's) National Survey of Health Development, which follows a cohort of individuals born in 1946, and the National Child Development Study (NCDS), which follows a cohort born in March 1958.

Joshi and Hinde (1993) use the MRC data to compare the survey members' mothers' employment following birth in 1946 (until 1961) with the employment patterns of their daughters following births between 1961 and 1977/78 (from school-leaving age to age 32). For the mothers, the analysis shows a quicker return to employment for manual workers, those with unskilled manual husbands and those in more prosperous regions. For their daughters (who were typically having children in the 1970s), being more educated and being younger are correlated with a quicker return, while the husband's occupation and region are no longer important. The

[5] Some papers have also attempted to control for the endogeneity of fertility in estimating the impact of children on female labour supply and the wages of mothers: see Angrist and Evans (1998), Gangadharan and Rosenbloom (1996), Iacovou (2001) and Millimet (2000).

daughters born in 1946 also return more quickly on average: their median length of absence is three years less than in their mothers' generation when controls for changes in observable characteristics are included. In both cohorts, return is most likely around the child's fifth birthday, but this peak is more marked for the more recent cohort. Joshi and Hinde also compare the mothers in the NCDS 1958 cohort with the 1946 cohort mothers and find that the former return more quickly following childbirth: their median length of absence is six years, compared with eight years for the older cohort.

Macran *et al.* (1996) also use the MRC and NCDS data, but compare mothers interviewed at around age 32 in 1978 with mothers interviewed at age 33 in 1991. They find that the earlier cohort tended to enter motherhood sooner and return to employment later than the more recent generation, with the reduction in the length of absence from employment most marked for older and more highly educated mothers. The study also considered retention in employment following return for the 1958 cohort: beyond a year back in the job, those who had returned more quickly were more likely to remain in the job, although younger and less educated mothers were more likely to leave the job sooner. Not surprisingly, the proportion of time spent in employment between the first birth and age 33 was smaller for mothers with subsequent children, lone mothers and the less educated. Dex *et al.* (1996) compare the same NCDS sample of mothers at age 33 in 1991 with a sample of mothers aged 30–34 in 1980 from the Women in Employment Study (WES). They find that the more recent mothers were more likely to return to employment between births than the 1980 sample and less likely to wait until all births were completed to make a return. Their comparison of cohorts also confirms that more recent mothers spent a greater proportion of time in employment following the first childbirth.

In Joshi *et al.* (1996), the 1991 NCDS data on mothers are used to estimate the probability that mothers will be in employment at age 33 and whether this will be full-time or part-time work. Their results show that, holding other factors constant, employment is more likely for mothers with older children, lone mothers and those with lower unearned income and higher wages. Most importantly, they find that employment, particularly full-time employment, is more likely for those with continuous employment (defined as being interrupted for less than nine months) following the first birth. The same data are analysed by Dex *et al.* (1998), who find that the return to employment following first childbirth is quicker, on average, for mothers with higher wages, more education, a less educated partner or no partner, in areas of low unemployment and for younger mothers. They also show that similar types of women are also more likely to be in paid work subsequently (with the exception of a greater likelihood for those with a more educated rather than less educated partner). The probability of subsequent employment is also greater for mothers who took maternity leave after the first birth, as proxied by a break of less than eight months. Finally, Waldfogel *et al.* (1998) impute maternity leave qualification for the NCDS sample of mothers in 1991 and show that qualification for the leave raises the probability that a woman will return to her job within a year of childbirth.

Some other studies of the effect of childbirth on women's employment have used alternative data sources. McRae (1993, 1996) reports findings from a national postal survey of women eight to nine months after giving birth in December 1987 or January 1988.[6] McRae finds that mothers who are more likely to have returned within eight to nine months of birth include those who received maternity pay or Maternity Allowance; those with higher levels of education; those with higher hourly pay or lower partner's income; those working in the public sector; and those with more children or who have completed their childbearing. She also shows that lone mothers are less likely to return to work within a year than mothers with partners. A similar set of factors are reported to be related to the probability of returning to work full-time rather than part-time (with the exception of hourly pay, which has an insignificant effect). Comparing the postal survey to the Policy Studies Institute's Survey of Maternity Rights for 1979, McRae (1996) reports that there has been a substantial rise in the proportion of mothers in the labour force nine months after birth: an increase from 24 per cent in 1979 to 45 per cent in 1988 for all mothers (and from 20 per cent to 33 per cent for first-time mothers). McRae (1996) also reports on a follow-up survey in 1993 of around 2,000 women who were employed during their pregnancy in 1987 or who were not employed during pregnancy but were looking for work after the birth. For this sample, some 20 per cent had not returned to some employment at some point by 1993 and many had moved from working full-time following the birth to part-time employment later on.

The Avon Longitudinal Study of Parents and Children (ALSPAC) is used to study the impact of maternity leave policies in Burgess *et al.* (2002).[7] As there is no information in the survey on whether the mother returned to the previous employer or whether she qualified for maternity rights, a mother is proxied as having maternity rights if she worked in the 28th week of pregnancy or later. Using sophisticated modelling techniques,[8] they find that mothers with maternity rights were more likely to have

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[6] A 66 per cent response rate generated 4,991 returned questionnaires and a sample of 2,471 women in work during pregnancy that was used in the initial analysis.

[7] This study covered 12,000 births in the county of Avon in 1991/92, from which a sample of 9,582 families were observed for 34 months after the birth.

[8] A Cox proportional hazard model is estimated to predict when mothers who had maternity leave would have returned in the absence of that leave. The model uses three methods to attempt to address the selection issue that mothers without maternity leave may be different in unobservable ways from those with leave: first, by including as controls attitudinal questions on what age a child can be left with an alternative carer; second, by excluding women who did not work at all in the pregnancy to create a non-maternity-leave sample of women with a 'strong' commitment to the labour force; third, by using the probability of being entitled to maternity leave as an instrument for maternity leave entitlement (with the instrumental variables including non-pregnancy-related reasons for leaving employment early during pregnancy such as moving house, negative workplace characteristics for working during pregnancy and mother's health during pregnancy).

returned when paid and unpaid leave ceased (at four and seven months respectively) and that mothers with lower skills and those with non-working partners mainly returned when paid leave stopped, while professional/managerial mothers with working partners tended to return when unpaid leave ended. The results also indicate that about one-half of the apparent impact of maternity leave rights is due to unobserved stronger labour market attachment of those entitled to leave rather than being a direct causal effect. Overall, Burgess *et al.* conclude that extensions to current maternity leave would encourage mothers to return later to employment following childbirth.

A final source of information on mothers' behaviour following childbirth has been the Policy Studies Institute's Maternity Surveys conducted in 1979, 1988, 1996 and 2002. Findings for the 2002 survey can be found in Hudson *et al.* (2004) and for the 1996 survey in Callender *et al.* (1997).[9] An important caveat to the results generated from these surveys is that the sample contains only mothers who have a suitable work pattern prior to birth to qualify for statutory maternity leave and pay. Hence, the conclusions are not necessarily applicable to the wider population of mothers and may conflict with those reached in other studies, most of which are based on representative samples. Hudson *et al.* report that 80 per cent of mothers had returned to work by 13–17 months after the birth, reflecting a higher rate of return than in 1996 and a much higher rate than in 1988. Mothers more likely to have returned included those in higher-level occupations, the better-paid, those with longer employer tenure, those working in the public sector, those with an employer with more work-life-balance policies and older women or those with partners. Similar types of women were also more likely to take their full entitlement to Additional Maternity Leave (AML), to which most of the sample were entitled. Those who were entitled to AML but returned early, generally reported that they did so for financial reasons (that they needed the earnings). Some mothers were entitled to Ordinary Maternity Leave (OML), most of whom took the full entitlement, while most women received Statutory Maternity Pay (SMP) for the full entitlement. About 40 per cent of the sample received extra-statutory payments and these helped them to take their full leave entitlement. Overall, the findings suggest that extensions to unpaid leave may have little effect on mothers' decisions to return to work, while extensions to paid leave may be more influential.

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[9] The most recent survey randomly sampled mothers giving birth in January 2001 with a postal survey 13 to 17 months after the birth in the spring of 2002. The survey received a 35 per cent response rate of 6,495 returned questionnaires and the sample for analysis included 3,920 mothers who had worked at least 26 weeks between August 1999 and the birth, thereby qualifying for the most basic statutory maternity leave and pay.

The impact of childbirth on women's employment has also been studied for other countries, although less extensively than for Britain. Waldfogel *et al.* (1998) compare the British case with the US and Japan.[10] They conclude that maternity leave makes it more likely that a woman will return to her job within a year of childbirth in all three countries, but that the largest effect is in Japan. Barrow (1999) also uses National Longitudinal Survey of Youth (NLSY) data (from 1994) to consider the issue in the US, finding that a return within a year of birth is less likely for mothers facing higher childcare costs and with higher other family income, but more likely for those with a higher wage or education and for those who had a working female role model.

3.3 Women's wages following childbirth

One of the first studies to analyse the impact of employment interruptions following childbirth on future wages was Joshi (1990) using data from the WES of 1980. Her results suggest that the pay penalties from career interruptions arose from returning to work part-time and the loss of employer tenure rather than the actual absence from work.

Joshi *et al.* (1999) use the 1991 NCDS data to analyse and decompose the 'family gap' in wages between childless women and mothers. The decomposition indicates that 59 per cent of the family gap in 1991 could be explained by the predominance of mothers in part-time work which tends to be lower paid than full-time employment. They also compare 'continuers' (those returning to employment 12 months or less after first childbirth) with 'returners' (those returning later than 12 months). For those working part-time, they find no difference in the subsequent wage between continuers and returners (or with childless women). But for those in full-time employment, childless women and continuers command similar wage levels, while returners fare worse in terms of hourly pay.

In two papers, Waldfogel (1995, 1998b) uses NCDS data[11] to show that the sizeable wage penalty from having children is only partly explained by the lower work experience for mothers. Not surprisingly, maternity leave is found to raise the

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[10] They use data from the NLSY for women aged 26 to 34 in 1991 for the US and the Panel Survey on Consumers 1995 data for women aged 24 to 34 in 1993 for Japan. Both of these data sources have the advantage over the comparative British NCDS data of maternity leave coverage being actually reported in the survey, although the Japanese data contain only 269 births.

[11] The papers use wage observations from mothers aged 33 in 1991 and from mothers aged 23 in 1981 to estimate ordinary least squares, difference and fixed-effects models to find the effects of children on wages. In the latter paper, controls for firm characteristics are also included in the regression with an imputed maternity leave variable.

likelihood that women will return to the same employer, but it is also shown to have a positive effect on subsequent wages. Interestingly, being covered by maternity leave and not returning confers no future wage advantage, while returning early without qualifying for maternity leave has some positive wage effects but the benefits are not as large as for qualifying and returning. Waldfogel's 1998 paper also shows comparative results for the US, using NLSY data.[12] Importantly, maternity leave rights are reported directly in the NLSY data and do not need to be imputed. The findings are remarkably similar to the British case, with the main difference in results being that there was no wage advantage to returning in the absence of maternity leave for women in the US.

The impact of childbirth and consequent employment interruptions on wages has also been analysed for women in the US by Waldfogel (1997b). She compares the wage penalty for two cohorts, using data for women aged around 30 in 1980 from the National Longitudinal Survey (NLS) of Young Women and for similarly aged women in the NLSY in 1991. Employment continuity over childbirth (defined as working for the pre-birth employer 12 months after birth) is associated with higher pay, but this can be explained by these women having higher pay prior to childbirth and because returning to the prior employer has gains in experience and job tenure.

3.4 Impacts on other work characteristics

Changes in work characteristics (other than the hourly wage) following childbirth have not been widely analysed. As already mentioned, several studies have highlighted the tendency for mothers to return to, or move into, part-time work at some point after childbirth and that the same set of characteristics that are related to a longer absence from employment also tend to be associated with part-time rather than full-time employment (Joshi *et al.*, 1996; McRae, 1993, 1996).[13] Hudson *et al.* (2004) find that 59 per cent of their sample returned to the same job with the same employer, which is maybe not surprising given that their sample of mothers consists of those qualifying for at least the most basic statutory maternity leave and pay. More interesting, though, is their report that 80 per cent of those changing jobs or employer did so for voluntary reasons, mostly to move to part-time work, but also to be able to work closer to home, to have less responsibility and to have more flexible hours. Finally, there is some limited evidence of occupational downgrading following childbirth, for example, as reported in Joshi and Hinde (1993) for mothers sampled in the 1946 MRC cohort data.

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[12] The American case uses a sample of women aged 18–25 in 1979/83 and women aged 26–34 in 1987/91.

[13] In addition, Dex *et al.* (1996, footnote 12) report that of the NCDS sample of mothers who were back in work within nine months of their first birth, only one-third were in a full-time job at the age of 33, with 41 per cent employed part-time and 25 per cent not employed.

4 Data sources

This chapter describes the surveys and the samples used in the analysis. It highlights some of the problems of constructing the required data-sets and the methods applied to address these issues. The final section details how the data sources offer considerable improvements over sources used previously.

4.1 The two surveys

Two sources of data are used in the analysis: the British Household Panel Survey (BHPS) and the Families and Children Study (FACS). The BHPS is an annual survey of approximately 10,000 adults from a nationally representative sample of over 5,000 households. At each wave, all adults living in the household complete a full questionnaire, and all individuals are re-interviewed in successive waves, together with any new adults living in the household. The vast majority of interviews are conducted during the autumn of each year, and the first 13 waves are used in this report, covering the years 1991 to 2003. The sample used here does not include any booster samples such as the European Community Household Panel addition. The FACS is an annual panel survey of families, defined as households with dependent children under the age of 16 or aged 16 to 18 and in full-time education. The main respondent to the survey is the Child Benefit recipient, which is usually the mother, but there is also a shorter interview for the partner in couples if the partner is available. The first two waves of interviews were conducted in the summers of 1999 and 2000 when the sample consisted of lone parents and low-income families (where low income covered approximately the lowest 40 per cent of couple incomes). In subsequent waves (from 2001), the interviews have been conducted in the autumn and have also included higher-income families to form a representative sample of all families with children. In each wave, sample boosters are added to ensure the sample remains representative of the entire population of families. The first five waves of the FACS are used in this report, covering the years 1999 to 2003. Both the BHPS and FACS collect information on current paid work and employment characteristics, together with the dates of spells of work and employer changes

since the prior wave or over the previous year.[14] Hence, the data permit precise dates for changes in employment participation to be identified and allow changes in work characteristics across interviews to be analysed.

In combining the two data sources, it should be noted that they survey different samples. The BHPS includes all individuals, while the FACS only interviews adults in households with dependent children. Throughout the report, the analysis is disaggregated by family type, with the BHPS alone used to provide data for households without children and both surveys combined to form a representative sample of individuals with children. However, only data from waves three to five of the FACS are used in most of the analysis as the initial two waves did not contain a representative sample of all individuals with children. Data for lone mothers from the first two waves are included when the analysis of mothers is disaggregated by partnership, and this FACS 'lone mother booster sample' allows a reasonably sized sample of lone mothers with which to perform separate analyses.[15]

Four main samples are used in the analysis: first, a sample of mothers of newborn children; second, a sample of mothers with a child entering school; third, a sample with all individuals divided into three broad cross-sectional categories of 'before or no children', 'children present' and 'children left'; and finally, a sample of all individuals with interviews two years apart. In all cases, individuals are limited to those aged 18 to 54. Children are defined as 'own' children under the age of 17 living in the household at the time of interview and includes own natural, adopted, step and foster children. Each of the samples is discussed in detail in the next section.

4.2 Four samples

4.2.1 The newborns sample

The newborns sample contains women who have a dependent child born since the previous interview or in the past 12 months in the absence of a previous interview.[16] Table 4.1 describes the main features of this sample.

Some 4,840 mothers with newborns were identified in the combined data-sets, with 2,071 from the BHPS, 2,437 from the FACS and a further 332 'booster sample'

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[14] In the BHPS, spells of activity are collected until 1 September of the year prior to interview, while spells are collected until they cover the previous interview or April of the previous year in the FACS.

[15] Data on couples from waves one and two of the FACS are not used at all. The term 'booster sample' (to describe lone parents observed in waves one and two of the FACS) is not used by the organisations that designed the FACS survey.

[16] The sample also includes step, adopted and fostered children currently living in the household with a date of birth since the previous interview or in the previous 12 months in the absence of a prior interview.

of lone mothers with newborns from the first two waves of the FACS. The vast majority of the main sample (that is, excluding the FACS lone-mother booster) consists of mothers with partners (3,793 or 84 per cent), and there are slightly more mothers with subsequent births than first-borns (2,474 or 55 per cent).[17]

Conditioning the analysis on prior work variables for this sample requires that the mothers have been interviewed in the wave prior to birth. Prior interviews are available for 2,531 mothers in the main sample (56 per cent), but a larger proportion of mothers of subsequent newborns have prior interviews than mothers of first-borns. This arises from the sample design of the FACS: being a survey of parents, mothers are not interviewed prior to the first birth.[18] For analyses that condition on prior work variables or consider changes in work characteristics over the critical period, the results were not affected by the imbalance of the sample in favour of subsequent newborns over first-borns.[19]

Table 4.1 Sample sizes for newborns and school entries

	Mothers with partners		Lone mothers			
	BHPS	FACS	BHPS	FACS	FACS booster	All*
All newborns	1,857	1,936	214	501	332	4,508
First newborns:	788	891	115	240	158	2,034
With prior interview	616	4	75	1	1	696
Subsequent newborns:	1,069	1,045	99	261	174	2,474
With prior interview	880	670	81	204	61	1,835
Return date:						
Uncensored	1,390	1,163	118	142	132	2,813
Censored	467	773	96	359	200	1,695
All school entries	1,747	1,683	330	549	396	4,309
First school entry	978	926	149	281	224	2,334
Subsequent school entries	769	757	181	268	172	1,975
Known work status:						
In June prior to entry	1,681	1,568	304	514	394	4,067
Following September	1,678	1,568	304	514	317	4,064

* All does not include the FACS booster sample for lone mothers. The FACS booster sample contains lone parents from waves one and two, while the main FACS sample uses parents from waves three to five.

[17] Mothers of first newborns are defined as those without any other own children under the age of 17 living in the household at the time of the interview following the birth, while subsequent births are those for whom such a child is present. Hence, mothers with older children who are either aged over 17 or who are not present in the household are still defined as mothers of first newborns.

[18] The few cases where mothers of first newborns have a prior interview in the FACS reflect a child either leaving the household or reaching the age of 17 between interviews.

[19] This was checked by using just the BHPS sample or by including controls for first and subsequent newborns.

Analysis of the length of absence from work following childbirth requires identification of the date at which the mother returns to work, but this date could not always be identified for two main reasons: First, the panel may not have continued long enough to cover the return date, particularly in the case of the shorter FACS panel, i.e. the return date was censored. Some 38 per cent of mothers with newborns have censored return dates (27 per cent in the BHPS and 46 per cent in the FACS). However, there is valuable information in knowing that the mother had not returned by the time of the panel termination and these 'right-censored' observations can still be used in estimating models of the length of absence from work following birth. The second reason that the return date could not always be identified was that mothers who have returned to working for their previous employer at the time of the interview following birth are likely to report the start date for their employment with that employer rather than the date they returned from maternity leave. In these cases, a return date could be imputed and this imputation is discussed in detail in Appendix B.[20]

4.2.2 The new schools sample

The second sample consists of mothers of a child who has recently started compulsory schooling at the age of four or five. School entry date is not recorded in either data-set but can be imputed from the child's birth date. However, age at school entry is not uniform across the country. In some areas, children start school in the September that they are aged four, while other areas delay entry until the start of the school term in which the child becomes five. For children with birthdays between September and December, the term of entry is the same in both cases, but for children with birthdays in the remaining part of the year, it is not known which year will be their first autumn term in school. For example, a child who is four in July 1999 will enter school in September 1999 in some areas but not until the start of the summer term (April) in 2000 in other areas. For the purposes of this report, mothers with school entry are defined as those with a child aged five in the September of the autumn of interview, which ensures that the child must have started school at some point in the prior year. Children with birthdays between September and December will definitely have started school in the previous autumn term, but children with birthdays in the remaining part of the year may not have entered until the January or April. However, the results were little affected when the data were disaggregated into those definitely starting in the September and those with a possible later start, indicating that the distinction is unimportant for this analysis.

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[20] There were also three other minor problems in calculating return dates: In 140 cases, the start date is missing for the spell (whether work or non-work) during which the child was probably born; it is assumed that the spell began prior to the birth. In 128 cases, the mother is reported as working during the birth month and then leaving work shortly afterwards, with an average gap of five months. For these cases, it is assumed that the mother was not working during the gap. Finally, in seven cases, the first spell date begins after the birth date with an average gap of six months. Again, it is assumed that the mother was not working during this interval.

The lower panel in Table 4.1 describes the main features of the school entry sample. Some 4,705 mothers were identified as having had a school entry in the previous year in the combined data-sets, with 2,077 from the BHPS, 2,232 from the FACS and a further 396 'booster sample' of additional lone mothers from the first two waves of the FACS. The majority of the main sample (that is, excluding the FACS lone-mother booster) consists of mothers with partners (3,430 or 80 per cent), but there are slightly more mothers with first school entry than subsequent entries (2,334 or 54 per cent).[21] Most of these mothers (4,064 or 94 per cent) have a reported work status both for the September during the autumn of interview (following the year of school entry) and for the June 15 months earlier (prior to the year of school entry) and can be used in the analysis of the changes in work behaviour around the time of school entry.[22]

4.2.3 The comparative cross-section sample

The third sample consists of all individuals divided into three broad cross-sectional categories of 'before or no children', 'children present' and 'children left'. The first and third categories consist only of individuals from the BHPS and are defined with the help of the fertility histories collected in wave B. 'Children present' includes those with a dependent child under the age of 17 living in the household at the time of interview, while 'children left' includes those whose children are all aged 17 or older (whether still in the household or not) or are under the age of 17 but not living in the household.[23,24]

The main features of this third sample are presented in the top panel of Table 4.2. The main sample of women (without the FACS lone-parent booster) consists of 62,791 interviews with 14,144 in the 'before or no children' group, 40,747 in the 'children present' group and 7,900 in the 'children left' group. The male counterpart contains 51,642 interviews similarly proportioned across the three broad groups.

Appendix A provides summary statistics for the demographic and work variables across the groups and between the BHPS and the FACS for the parents. It should be noted that several of the work variables are only available in the BHPS and their analysis is restricted to the single data source. When available in both surveys, the data are generally consistent between the BHPS and the FACS. However,

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[21] The higher proportion of first school entries compared with first newborns may arise because it is more likely that older siblings have left the household or reached age 17 at the time of school entry rather than at the time of birth.

[22] Such completeness is not surprising given that, even in the absence of a prior interview, the work histories are collected to the spell covering the previous September in the BHPS and to the spell covering the April of the previous year in the FACS.

[23] This last group is referred to as those with children who have grown up or left home.

[24] Individuals with a single interview in the panel aged under 33 and with no children present were also classified as 'before or no children'.

inconsistencies in the derived hourly wage variables between the two data sources could not be resolved and only gross wages from the BHPS were used in the gender wage gap analysis. Full details are provided in the appendix.

Table 4.2 Sample sizes for comparison groups

	Individuals with partners		Single individuals		
	BHPS	FACS	BHPS	FACS	FACS booster
Women	29,322	15,330	12,286	5,853	4,133
Before or no children	6,743	0	7,401	0	0
Children present	16,196	15,330	3,368	5,853	4,133
Children left	6,383	0	1,517	0	0
Men	25,076	14,660	11,674	232	196
Before or no children	5,930	0	9,560	0	0
Children present	14,342	14,660	281	232	196
Children left	4,804	0	1,833	0	0
Women with two year changes in employment characteristics:					
Before or no children	3,267	0	3,261	0	0
Newborn	557	110	37	12	14
Pre-school children	549	182	52	46	51
School entry	550	217	61	36	67
Primary-school children	1,185	399	226	129	168
Secondary-school children	1,558	514	296	168	278
Children left	2,800	0	564	0	0
Men with two year changes in employment characteristics:					
Before or no children	2,844	0	4,108	0	0
Newborn	1,003	201	38	0	1
Pre-school children	706	229	0	1	0
School entry	845	302	11	1	0
Primary-school children	1,225	436	9	3	6
Secondary-school children	1,385	499	35	8	17
Children left	2,325	0	758	0	0

Note: The FACS booster sample contains lone parents from waves one and two, while the main FACS sample uses parents from waves three to five.

4.2.4 The comparative panel sample

The fourth and final sample consists of individuals with interviews two years apart and is used to analyse whether changes in work characteristics for women following birth and school entry are significantly different from those experienced by women at other times in the lifetime profile and from those of men at the same critical points.

The initial interview of the two-year gap for mothers with newborns is that immediately prior to the birth and the latter interview, is the second interview after birth. For mothers with children entering school, the initial interview is in the autumn when the child is aged three in the September; and the latter interview is in the autumn when the child is aged five in the September. In the case where there is a newborn and a school entry in the same period, the newborn takes precedent in terms of the group categorisation.

Using a two-year gap rather than a one-year gap has two advantages: First, not many mothers are back in work at the time of the first interview after birth, and the second interview increases the size and representativeness of the sample. Second, the two-year gap for school entry ensures that the child is definitely not in school at the initial interview and is definitely in school at the latter interview, while the school status may be uncertain at the intervening interview. The main drawback of using the two-year gap rather than a single-year gap is that it reduces the sample size, particularly for the FACS sample, which only covers three years for couples.

Five comparison groups were used: 'before or no children', 'pre-school children', 'primary-school children', 'secondary-school children' and 'children left'. The 'before or no children' and the 'children left' categories are defined in the same way as in the three broad categories described in Section 4.2.3 and are mutually exclusive from all other groups. For the other three comparison groups, which are not mutually exclusive, individuals are categorised by the status of their youngest child on the grounds that the age of the youngest child has the greatest influence on work behaviour. However, the interview following a birth is always classified as 'newborn' and the interview following school entry is always classified as 'school entry' as long as there is no newborn at the same or previous interview. Sequences of three interviews were only included for the comparison groups if the individual was in the same category in all three waves.[25]

Sample sizes for the different groups are presented in the lower panel of Table 4.2. It should be noted that the analysis of the changes in work characteristics uses a select group of individuals who are in employment at both interviews. This is particularly important for the newborn and school entry samples, where many women are not in work at one of the interviews and the sample sizes are considerably smaller than those used in the direct analysis of these groups. In addition, the samples used to analyse the changes in the wages of full-time workers

[25] Consider the following hypothetical example: A woman is interviewed for 13 years and has one child, appearing as a newborn at interview two (that is, born in the year prior to the second interview) and as a school entry at interview seven (that is, entered school at some point between the fifth and seventh interviews). This woman would contribute seven observations of two year changes: interviews one to three as a newborn; interviews three to five and four to six as pre-school comparisons; interviews five to seven as school entry; and interviews eight to ten, nine to eleven and ten to twelve as primary-school comparisons. Consider a more complicated hypothetical example where an otherwise identical woman has a second child appearing as a newborn at interview six and as a school entry at interview eleven. This woman would contribute five observations of two year changes: interviews one to three and five to seven as newborns; interviews three to five and eight to ten as pre-school comparisons; and interviews nine to eleven as school entry (the school entry of the first child not being included as it occurred over the same two years as the birth of the second child).

are even smaller as a large proportion of mothers who are in employment do not work full-time.[26]

4.3 Advantages over previously used data sources

The surveys previously used to analyse the impact of childbirth on women's employment had several drawbacks and it is useful to summarise them in order to highlight how the data sources used here may address some of these issues.

Most of the previous literature has used surveys that are now quite dated. All of the publications, bar one, use information on births from 1991 or before, many even reporting on births many years prior to that. Given the rapid developments in women's and particularly mothers' labour market behaviour, it is especially important that further work should be more up-to-date. The BHPS and FACS provide data covering the entire 1990s and right up to 2003.

Previously used data sources have not always been representative of the general population of women. Both the postal surveys used by McRae and the Policy Studies Institute (PSI) Maternity Survey have relatively large samples, but the low response rate (particularly in the PSI survey) may give cause for some concern on how representative they are. In addition, the follow-up survey used by McRae and the analysis of the PSI survey selected women based on their employment characteristics, restricting the applicability of their conclusions to the wider population. The Avon Longitudinal Study of Parents and Children (ALSPAC) drew a sample from a small geographical area (the county of Avon), which could also give concerns about any unobservable conditions specific to this particular area. Finally, the cohort studies – the Medical Research Council's (MRC's) National Survey of Health Development and the National Child Development Study (NCDS) – and the Women in Employment Study (WES) sample omit births for women beyond the ages of 32, 33 and 34 respectively. In contrast, the BHPS and FACS provide nationally representative samples of all women.

Past data sources have differed substantially in the length of time after birth that information is collected from mothers and the length of time over which events are recalled. The cohort studies (MRC and NCDS) and the WES use data recollected when the mothers are in their early thirties, which have the advantage of being able to observe longer-term effects but also the drawback that recalling labour market information over longer periods may be subject to specific biases[27] or lead to a high

[26] The number of women reporting a wage change is 489 for the newborns category and 483 for school entry, compared with 178 and 148 when the samples are restricted to those in full-time work and reporting a wage at both interviews.

[27] For example, it has been shown that individuals with the most transient behaviour are more likely to give inaccurate accounts of prior labour market experience as the recall period lengthens. Prime-age women in particular tend to lengthen their reported spells out of the labour force and to redefine spells of unemployment as out of the labour force over longer recall periods (Paull, 2002).

proportion of missing data.[28] In the case of analysing developments in wages, Waldfogel (1998b) argues that considering long differences (over an average of eight years in her case) has two advantages: it allows more women to have returned to work, creating a more balanced sample of wages, and it allows any accumulation of effects over time to be tracked. The surveys covering shorter periods since birth (McRae's first postal survey and the PSI Maternity Survey) are less likely to suffer from recall errors but have the disadvantage that they can only look at shorter-run effects. One of the main improvements from using the BHPS and FACS is that the panel nature of the data means that while the recall period is limited to a length of a little over a year, the effects of childbirth can be considered over a longer period, up to over 12 years in the case of the BHPS.

Finally, some of the surveys used in the previous literature do not collect all the information that would ideally be needed to analyse mothers' employment decisions following childbirth. There is no direct reporting on maternity leave in the cohort data (MRC and NCDS) and analysts have either imputed maternity leave qualification from the work experience prior to childbirth or proxied it with the length of absence from employment following childbirth. As the main focus of the ALSPAC survey was not economic, mothers' wages were not recorded and have been proxied by social class, while other household income was proxied by partner's employment. There is also no information in the ALSPAC survey on whether the mother returned to the previous employer or whether she qualified for maternity rights. While the BHPS and FACS do not address these issues completely, wages and income are measured directly and the information on work and employer tenure allows a greater degree of accuracy in the imputation of maternity rights.

[28] For example, Dex *et al.* (1998) report missing data on job transitions for 15 per cent of months since motherhood in the NCDS 1991 data.

5 Children and employment

This chapter considers the effect of children on women's participation in formal paid work. Section 5.1 begins with a broad picture of the gender differences for those with and without children using the comparative cross-section sample. The newborns sample is used in the following three sections to analyse women's employment following childbirth. The first of these (Section 5.2) considers the length of absence from work following childbirth and its relationships to demographic and family background and to the mother's work characteristics prior to childbirth. An analysis of the impact of maternity rights on how soon women return to work is presented in Section 5.3, while Section 5.4 looks at the permanency of return to work following childbirth and the interruptions caused by subsequent births. Section 5.5 uses the sample of school entry mothers to investigate changes in women's work participation around the time of school entry. Section 5.6 addresses the question of whether newborns and new schools are critical events for women's work participation using the comparative panel sample to compare changes in work participation around these times with changes at other times for women and with changes for men at the same stages in family formation. A summary on work participation is presented in the final section.

5.1 Cross-section analysis

Prior to the arrival of children, men and women are equally likely to be in formal paid work (Table 5.1). The presence of children is related to a substantial change in the propensity to work for both genders, but in opposing directions. Some 81 per cent of men are reported to be working prior to the arrival of children and 89 per cent work when children are present, but the percentage of women working prior to children (82 per cent) declines dramatically to 64 per cent for those with children. The gap between the genders narrows for those whose children are no longer in the household (84 per cent of men and 74 per cent of women work) but does not disappear entirely: this supports the hypotheses that children are crucial in explaining gender differentials in work participation and that there is a mechanism that ensures that these differences have persistent long-term impacts.

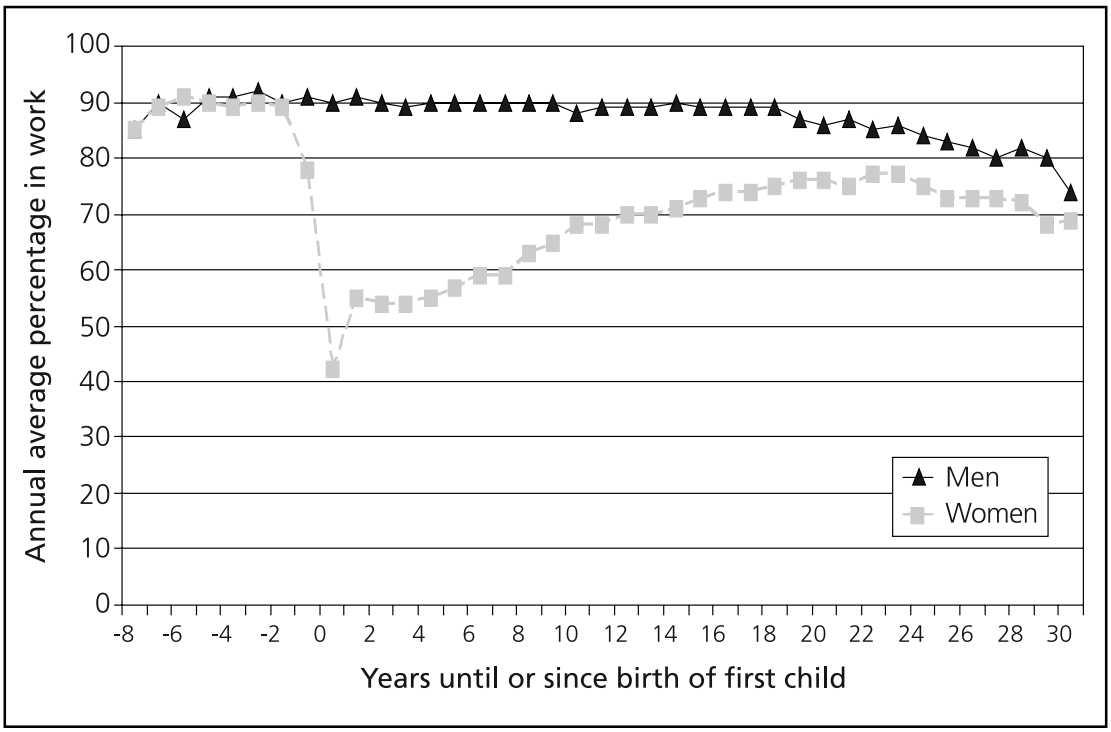
Table 5.1 Work rates

	With partner		Single		All	
Percentage in work	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**
Before or no children	91.8	88.0	74.4	76.3	81.1	81.9
Children present	89.9	67.9	57.1	48.5	89.4	64.0
Children left	86.5	75.2	78.9	66.9	84.4	73.6

Single individuals are less likely to work than those with partners, whatever their gender or parental status, but the presence of children has a greater impact on work participation for lone parents than for adults with a partner. This suggests that at least some of the differences between mothers with partners and lone mothers may be due merely to the absence of a partner or to inherent differences in the propensity to work between people likely to be partnered and those likely to be single.

Greater detail is added to this picture in Figure 5.1, which presents work rates for men and women by years before and since the birth of the first child. The work rates are calculated as the average proportion of men or women in work during the year, with year one as the year prior to birth, year 0 as the year following birth, year one when the child is one year old, and so on. Women on maternity leave are counted as **not** being in work, and full-time students are included in the sample.

Figure 5.1 Work rates by years before and since birth of first child



Men and women are almost identical in their rates of work until the year before the arrival of the first-born. The arrival of the first-born has no impact on the participation rate for men and the proportion of men in work remains virtually

constant for almost 20 years following the first birth. In contrast, the average annual participation rate for women drops below 80 per cent in the year prior to arrival (year –1), reflecting a decline in work during the months running up to the birth. In the year following the birth of the first-born (year 0), the work rate for women plummets to just over 40 per cent, reflecting both that virtually all women do not work during the three months following birth and that a substantial proportion do not work at all during the year.[29] The work rate jumps up to around 55 per cent in the following year and then climbs steadily for 20 years, but remains below that for men even at 30 years after the first birth.

This picture suggests that there are no anticipatory effects of children on work participation, but the arrival of the first child marks a distinct decline in women's propensity to work, followed by a very gradual and slow rise in the proportion of women who work as the child ages. There is no evidence of a dramatic change in mother's work when the first child enters school at around age four or five.

5.2 Employment rates following birth

This section focuses on employment changes around the time of childbirth using the sample of mothers with newborns. Figure 5.2 plots the percentage of women who have returned to work[30] at some point since birth in the 96 months following childbirth (note that some of the women in the sample will go on to have more children: Figures 5.2 to 5.4 do not analyse how women return to work after their final newborn, but how they return to work after any newborn, irrespective of whether they have more children in the future).[31] Roughly half of all women (the middle line on Figure 5.2) have returned to work at some point by a year after the birth, but only an additional quarter have returned by the end of five years since birth. Indeed, even by eight years after birth, over ten per cent of mothers have never returned to employment at any point.[32]

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[29] This will be shown in greater detail in the next section.

[30] The term 'return to work' is used regardless of whether the woman was in work prior to the birth or, indeed, has ever worked.

[31] Table A.3 presents the sample sizes used to construct Figures 5.2 to 5.4 and the distribution of mothers with newborns across first and subsequent newborn and whether the mother was working prior to the birth.

[32] Figure 5.2 is consistent with similar previous statistics. McRae (1996) reports that 20 per cent of women had not returned to work at some point during the first seven years following birth, which is similar to the proportion shown in Figure 5.2 for 84 months after birth. The report by Hudson *et al.* (2004) of 80 per cent of mothers returned by 13–17 months after birth is for a sample of mothers fulfilling the employment requirements for statutory maternity leave and pay, who would be expected to return more quickly than the representative sample used here.

Figure 5.2 Work return rates after childbirth

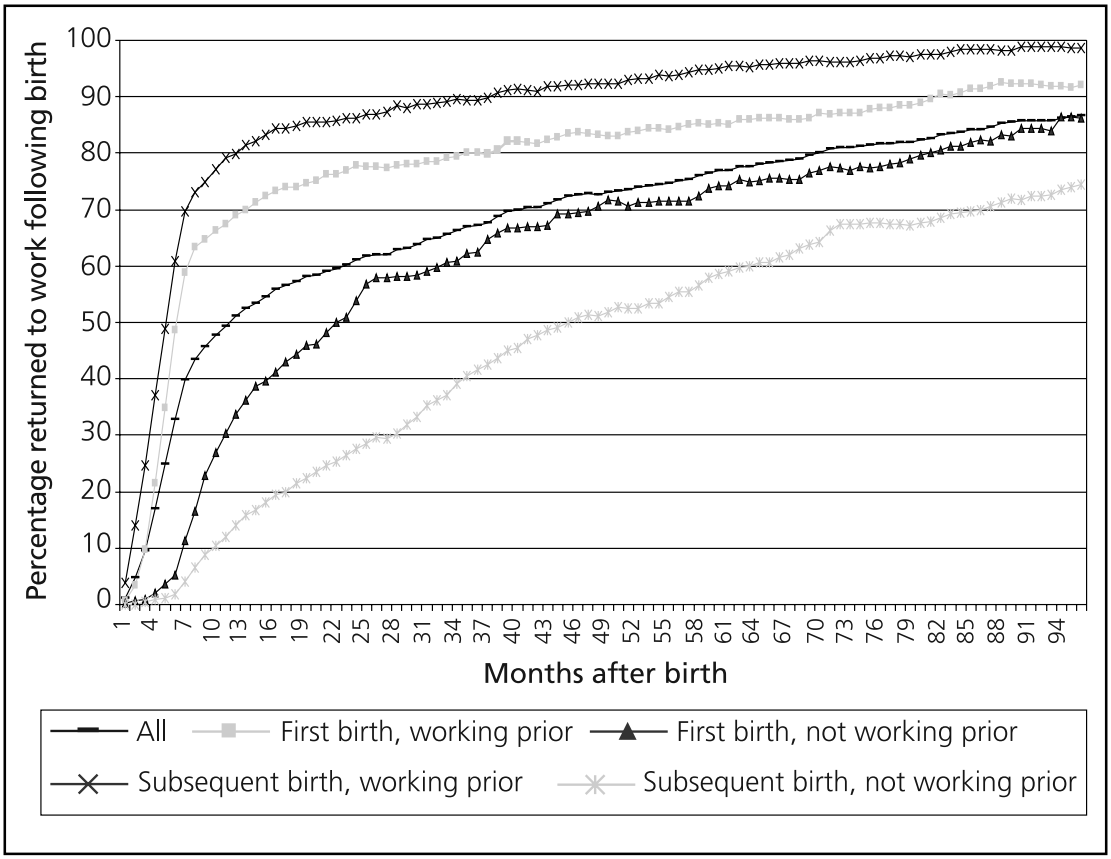


Figure 5.3 Work return rates after childbirth: by partnership

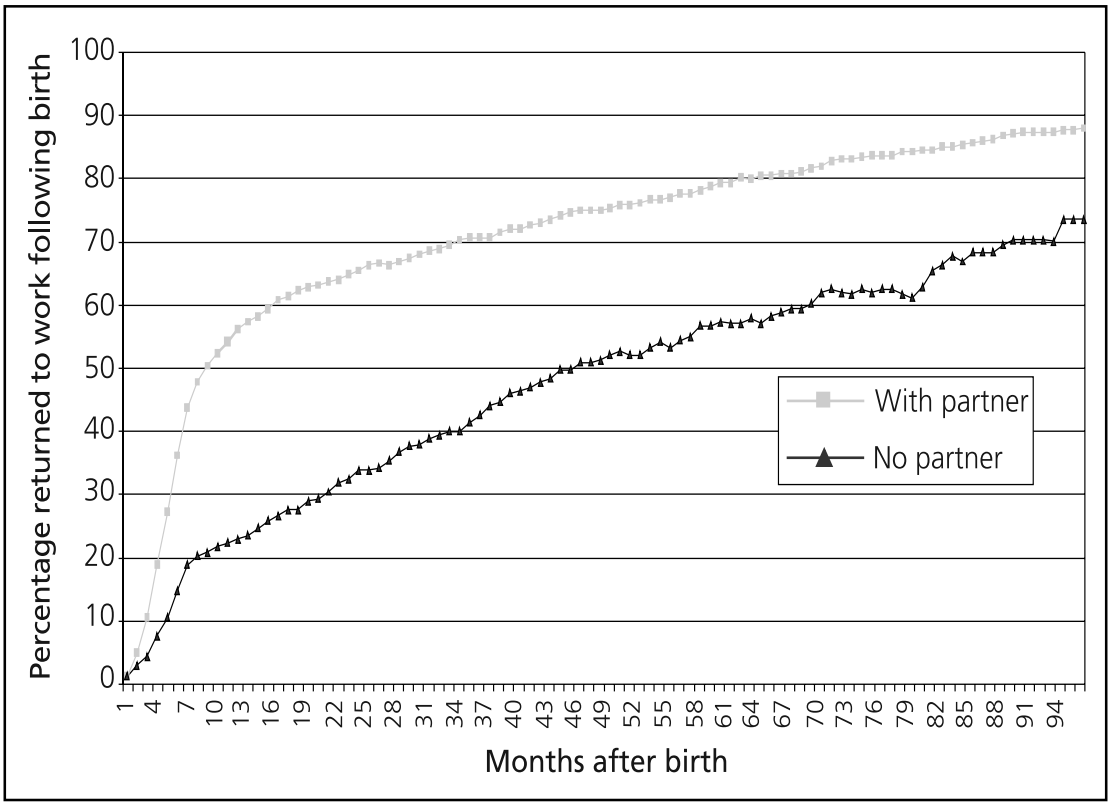


Figure 5.4 Work return rates after childbirth: by partnership and type

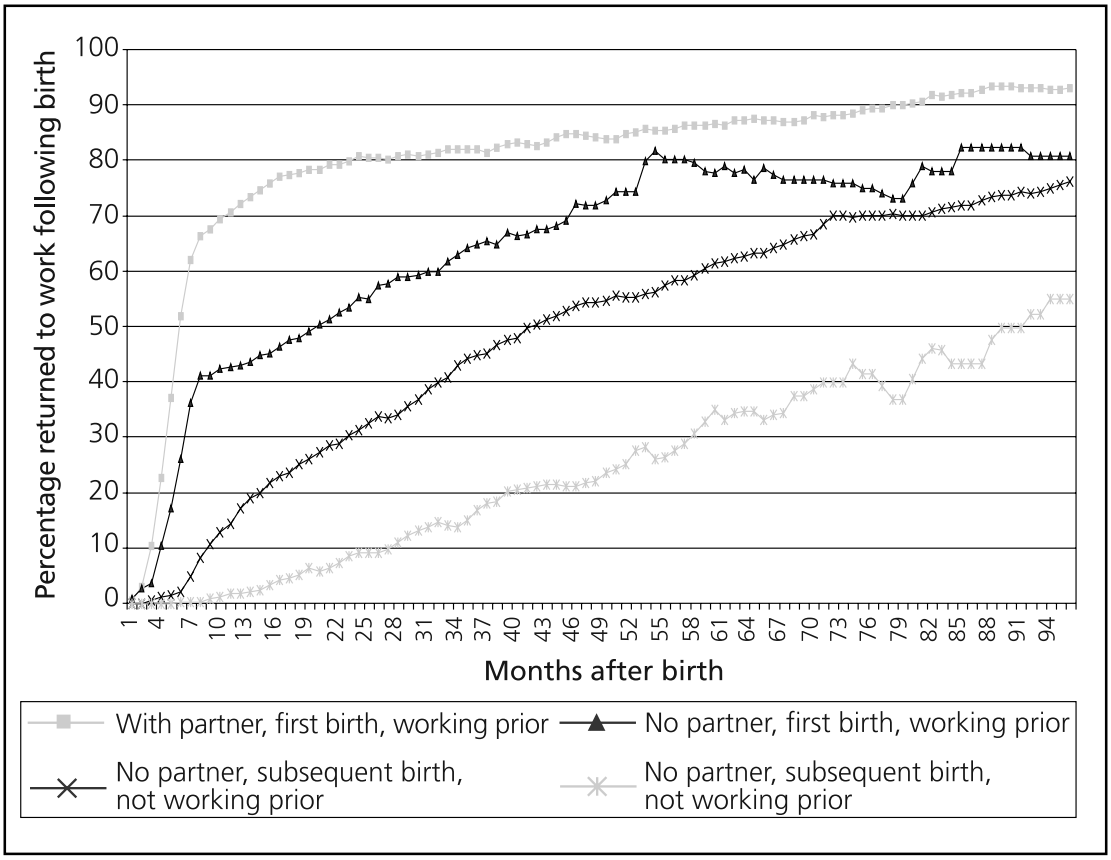


Figure 5.2 also shows that the rate of return depends upon whether the birth is a first or subsequent birth, and whether the mother was working prior to the birth (defined as any work in the previous year). On average, mothers with first births return more quickly than mothers with subsequent births, but mothers with subsequent births who were working prior to the birth have the quickest return rates, and mothers with subsequent births who were not working prior to the birth have the slowest return rates. To look at this another way, because so many women work prior to their first birth, knowledge of a woman's previous work history is not very useful in predicting how long she will stay out of work after the first birth. On the other hand, whether a woman is working prior to a subsequent birth is an extremely good predictor for whether she will work after that birth. This empirical observation could result in two ways: It may merely reflect that women vary in their attachment to work, but that this only affects whether a woman works or not once she has a child. On the other hand, it may reflect that there is dynamic persistence in labour market choices, so that the choices women make after the first birth directly affect the options open to them after subsequent births. It is not possible to distinguish between these two possibilities here, but if the latter were true it would suggest that encouraging mothers to return to work between births would be an important factor in ensuring a quicker return after subsequent births.

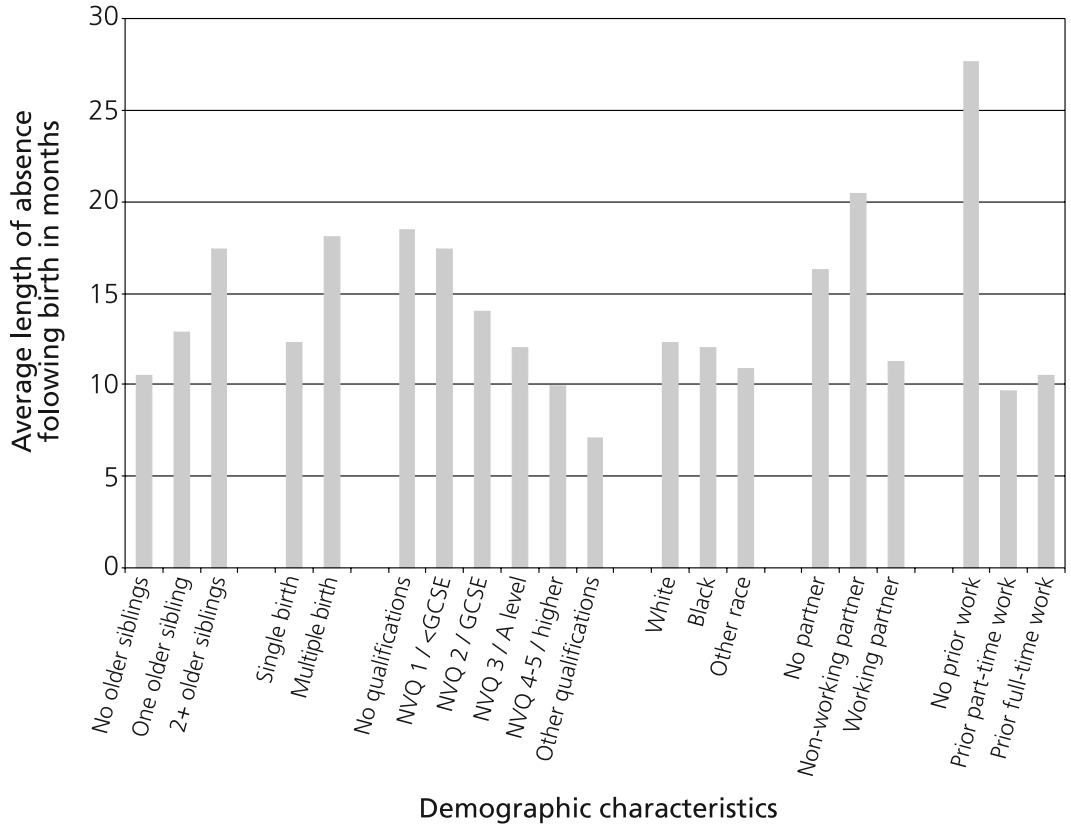
Mothers with partners return more quickly than lone mothers (Figure 5.3), although this may partly be explained by the fact that mothers with partners are more likely to

be in work prior to childbirth than lone mothers (see Table A.3). Note that the labels 'with partner' and 'no partner' in Figures 5.3 and 5.4 describe the family status at the time of the birth; many of the women in the sample will experience a change in their family status in the following 96 months, and the graphs do not condition on women whose family status is unchanged. Figure 5.4 presents the return rates for mothers with first births who were working prior to birth and for mothers with subsequent births who were not working prior to birth and shows that, even conditioning on these variables, lone mothers return to work at a considerably slower rate than their partnered counterparts.

The relationships between the rate of return to work and other characteristics are explored further in Figures 5.5 and 5.6. These graphs present the average length of absence from work following childbirth for different demographic groups (Figure 5.5) and by the mother's work characteristics prior to the birth (Figure 5.6).[33] It should be noted that these lengths are the average for uncensored observations – that is, for mothers who are observed to return to work within the lifetime of their presence in the panel. Hence, they will understate the true average length of absences but they do indicate the nature of the differences across groups.

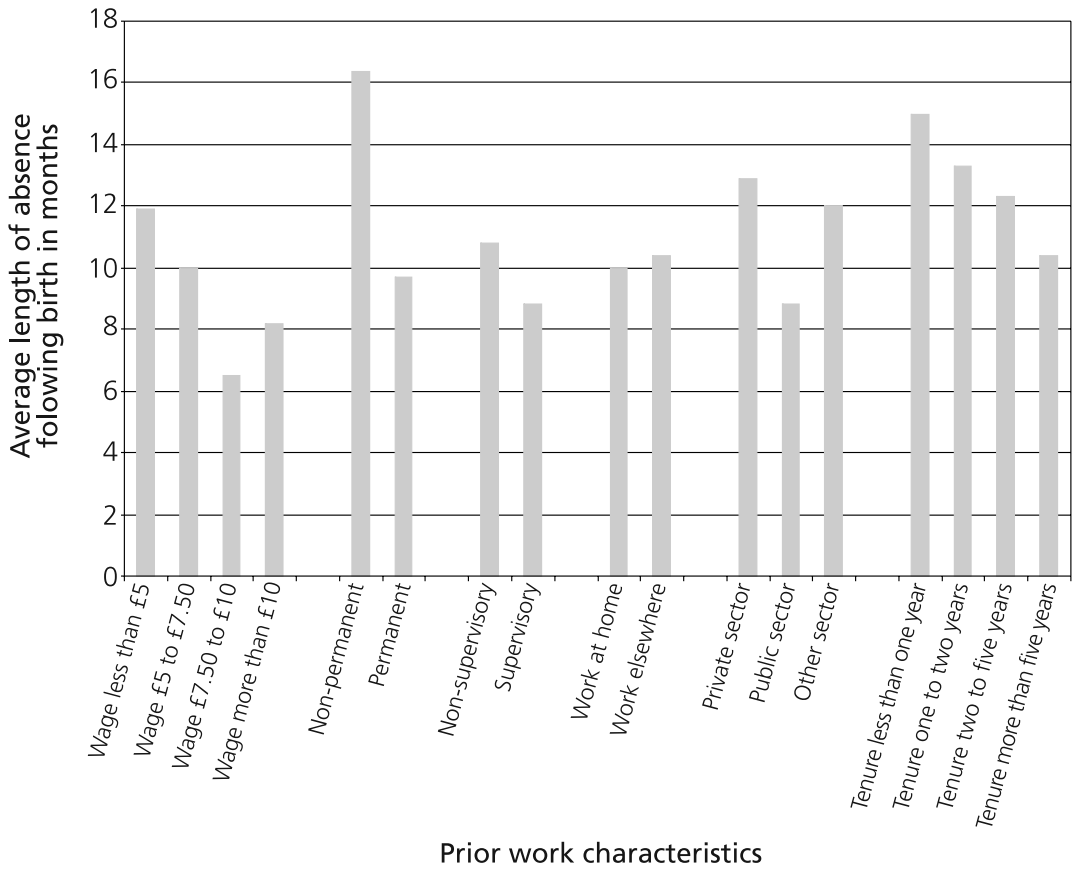
[33] Mother's work characteristics prior to the birth use information from the interview prior to birth. If work characteristics were not available for that interview, information from the interview prior to that was used.

Figure 5.5 Average length of absence following birth for uncensored sample: demographic characteristics



Notes: The average lengths are calculated using uncensored observations. Sibling refers to a sibling of the newborn. Qualifications show the highest level obtained. Part-time work is defined as working less than 30 hours each week and full-time as working 30 or more hours each week.

Figure 5.6 Average length of absence following birth for uncensored sample: prior work characteristics



Notes: The average lengths are calculated using uncensored observations.

As already indicated in the earlier graphs, mothers with first-borns (no older siblings[34]) have shorter absences, on average, than mothers of newborns with one older child and considerably shorter absences than those with two or more older children. Mothers with births of twins or triplets take a longer absence on average than those with a single birth, which is not surprising as a multiple birth is likely to involve multiple costs to returning to work (financial and non-financial) without multiple benefits of being back at work. Women with lower levels of education take longer absences than the more educated. This may reflect relative wages or employment opportunities across education groups, with the more highly educated forgoing higher earnings from remaining absent. Ethnic group appears to have little impact on the average length of absence. The presence of a partner is related to a shorter length of absence, but only if the partner is working. Women with non-working partners take longer absences on average than lone mothers, which may reflect that women with partners not in work tend to have poorer work opportunities themselves (either through a matching in education and work skills between the

[34] 'Sibling' always refers to a sibling of the child and never means a sibling of the mother. Sibling and older children also refer only to those still living in the household and under the age of 17.

woman and her partner, or through local economic conditions). Finally, Figure 5.5 shows again that women not working prior to the birth have much longer average absences than those working prior to the birth, but, interestingly, there is little difference in the length of absence between those previously working part-time and those previously working full-time.[35]

Figure 5.6 presents the average length of absence across different prior work characteristics for women who were in work prior to birth. It should be noted that the scale on this graph is larger than that on Figure 5.5 and that the differences across work characteristics are generally not as great as those across the demographic variables. Reflecting the differences across education level, women earning lower wages take longer to return to work than those with higher wages, although the pattern is not consistent across the wage groups considered. As with the education category, higher-earning women have a greater incentive to return to work earlier than those with lower monetary returns. Not surprisingly, those previously in permanent positions return more quickly than those in non-permanent jobs, but there is little difference across supervisory level or the place of work. Interestingly, women previously working in the public sector take shorter average absences than those in the private or 'other' sector. This may indicate that women working in the public sector have better-paying work or are more likely to be in permanent positions than in other sectors, or it may reflect that the type of work undertaken or the conditions of employment in the public sector may make it easier to combine motherhood with work than in other sectors. Finally, women with longer employer tenure prior to birth have shorter absences on average; this may reflect that women with longer tenures tend to earn higher wages or have better working conditions or have a greater attachment to the workplace than those with short tenures, all giving them, on average, a greater incentive to return sooner.

Figures 5.5 and 5.6 do not provide a completely satisfactory account of the factors influencing the length of absence, for several reasons. First, average lengths across groups can only be calculated using uncensored observations, which will understate the true differences between groups because longer durations are more likely to be censored. Second, the discussion above has shown that many of the factors may be interrelated and it is not possible to discern which one of them is directly related to the length of absence. For example, it is not clear whether being more educated in itself encourages women to return sooner or whether it is because more highly educated women can command higher wages that they take shorter absences. Finally, it is important to establish whether the observed differences are significant in a statistical sense. In other words, it is necessary to check whether the samples used are of sufficient size and the observed relationships of sufficiently small variation across the sample, to ensure that the resulting statistics are likely to be an accurate representation of the entire population.

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[35] Part-time is defined as working less than 30 hours each week and full-time as working 30 or more hours each week.

These three issues can be addressed by estimating 'survival models' for the length of absence from work. Survival models analyse how the duration of a particular state (how long a condition survives) is related to other variables. The models are estimated using both censored and uncensored observations, the latter contributing the information that the mother has not yet returned to work at the point of censoring. Such models also have the advantages of being able to include a wide range of variables and of showing the effect of an individual characteristic controlling for related differences in other variables. Finally, the statistical significance of the relationship between the length of absence and each characteristic can be tested to check that any observed correlation is not simply the luck of the draw in the selected samples. The only drawback of the particular type of survival model used here is that it is not easy to present predicted values of the length of absence for different types of mothers.[36] However, the results are presented in terms of time ratios for each characteristic, which have a relatively straightforward interpretation in showing the predicted length associated with that category or value relative to the predicted length for the omitted category or to the zero value. Hence, ratios less than one indicate a factor associated with a shorter absence from work than the omitted category or zero value, while ratios greater than one indicate categories or values associated with a longer absence. For example, a time ratio of 0.5 suggests that the average length of absence for women with that characteristic will be half that of those with the omitted category or zero value, while a time ratio of two suggests that the duration will be twice as long.

The estimates from the survival models are presented in Tables 5.2 and 5.3. Four different specifications were estimated. The first includes demographic and family characteristics as explanatory variables, while the second adds whether the mother was not working, was working part-time or was working full-time prior to the birth.

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[36] There are several different types of survival models. The nature of the estimated relationships will depend upon the particular form of survival model used: a lognormal survival model is used here because this particular function allows the probability of leaving the state (exiting maternity leave to return to work) to first increase as time goes by and then decrease, which fits with the data on the length of absence from work (as shown in the hazard models in Section 5.3). The models estimated here also include controls for unobserved heterogeneity, which allows for the possibility that there may be distinct groups in the data in terms of the length of maternity leave that are not identified by the observed variables. For example, in the case of maternity leave, it could be argued that there are two types of women: one with strong attachment to the labour market who return early and a second with weak attachment who return later. If other observable characteristics were related to this feature, the estimates might suggest a spurious relationship between the length of absence and the observable variables if there were no controls for the unobserved heterogeneity in labour market attachment. The presence of unobserved heterogeneity was tested and found to be a significant factor in the models. However, the inclusion of controls for unobserved heterogeneity means that predicted values from the models cannot be derived in a straightforward manner for different groups of mothers.

The third specification adds a range of variables about the woman's work experiences before the birth and can only be estimated for those in work at either the interview immediately prior to the birth or the one prior to that. Specification 4 adds prior work variables that are only present in the British Household Panel Survey (BHPS) sample. As a check that differences between the last two specifications are not due to the change in sample, specification 3 is also estimated with the restricted BHPS sample that is used in the final specification. Specifications three and four could not be estimated separately for mothers with partners and lone mothers because there were too few lone mothers with prior work variables.

Table 5.2 Survival models for the length of absence from work following birth: demographic characteristics

	Specification 1			Specification 2		
Time ratios for explanatory variables	**All mothers**	**Mothers with partners**	**Lone mothers**	**All mothers**	**Mothers with partners**	**Lone Mothers**
No. of older siblings:						
none	omitted	omitted	omitted	omitted	omitted	omitted
1	1.200***	1.200***	1.481**	0.839**	0.796**	0.709
2+	1.504***	1.471***	2.598***	0.903	0.832	0.954
Younger sibling	1.304**	1.395***	0.945	1.454***	1.476***	0.835
Months gap with:						
Older sibling	0.996***	0.997***	0.997	1.000	1.002	0.997
Younger sibling	0.996*	0.995*	1.002	0.993**	0.993**	1.001
Multiple birth	1.299*	1.439*	0.701	1.178	1.611*	1.121
Mother's age	0.989***	0.993	0.951***	1.008	1.003	1.025
Mother's education:						
1. No qualifications	omitted	omitted	omitted	omitted	omitted	omitted
2. NVQ 1/<GCSE	0.682***	0.741**	0.510***	1.003	0.991	0.731
3. NVQ 2/GCSE	0.543***	0.529***	0.373***	0.830*	0.751**	0.637*
4. NVQ 3/A level	0.492***	0.522***	0.311***	0.837	0.830	0.510**
5. NVQ 4–5 / higher	0.470***	0.477***	0.064***	0.774**	0.744**	0.271***
Mother's ethnicity:						
White	omitted	omitted	omitted	omitted	omitted	omitted
Black	1.170	1.573	1.060	1.958**	3.330**	4.036***
Other non-white	1.585***	1.543***	3.241***	1.610***	1.472**	1.404
Health problem	1.215***	1.260***	1.544**	1.076	1.084	1.123
Working partner	0.498***	0.547***	excluded	0.629***	0.696**	excluded
Non-working partner	0.876	omitted	excluded	0.977	omitted	excluded
Partner's earnings	excluded	1.0004***	excluded	excluded	1.0007***	excluded
Partner's work hours	excluded	0.999	excluded	excluded	0.994*	excluded

Continued

Table 5.2 Continued

Time ratios for explanatory variables	Specification 1			Specification 2		
	All mothers	Mothers with partners	Lone mothers	All mothers	Mothers with partners	Lone Mothers
Mother's prior work:	excluded	excluded	excluded			
Not working				omitted	omitted	omitted
Part-time				0.259***	0.275***	0.144***
Full-time				0.221***	0.229***	0.150***
Log likelihood	–4,825.4	–2,872.9	–860.0	–2,542.7	–1,635.2	–281.0
No. of observations	3,945	2,253	920	2,187	1,364	360

Notes: Time ratios significantly different from one at the one per cent level (***), five per cent level (**) and ten per cent level (*). Sibling refers to a sibling of the newborn and not of the mother. All models include controls for unobserved heterogeneity: the null hypothesis of no unobserved heterogeneity was rejected at the one per cent level for the models with all mothers and mothers with partners and at the five per cent level for lone mothers. The time ratios are significantly different between: 1 and 2+ older siblings in specification 1; educ2 and educ3 in specification 1 and for all mothers and mothers with partners in specification 2 ; educ2 and educ4 in specification 1 and for all mothers in specification 2; educ2 and educ5; educ3 and educ4 for all mothers in specification 1; educ3 and educ5 in specification 1 and for lone mothers in specification 2; black and other non-white for all mothers and lone mothers in specification 1; working partner and non-working partner; prior part-time work and prior full-time work for all mothers and mothers with partners. Those with education group 6 (other qualifications) were omitted from the regressions as there were too few observations (256) to estimate a time ratio for the category.

Table 5.3 Survival models for the length of absence from work following birth: prior work characteristics

Time ratios for explanatory variables	Specification 3		Specification 4
	BHPS and FACS	Restricted BHPS	BHPS
Family background and demographic characteristics			
No. of older siblings:			
none	omitted	omitted	omitted
1	0.715***	0.704***	0.735**
2+	0.665***	0.644***	0.658***
Younger sibling	1.160	1.016	1.061
Months gap with:			
Older sibling	0.999	1.001	1.001
Younger sibling	0.995*	0.995*	0.995*
Multiple birth	1.216	1.235	1.367
Mother's age	1.006	1.000	1.014
Mother's education:			
1. No qualifications	omitted	omitted	omitted
2. NVQ 1/<GCSE	1.046	1.228	1.383
3. NVQ 2/GCSE	0.947	1.026	1.144
4. NVQ 3/A level	1.028	0.963	1.078
5. NVQ 4–5/higher	0.990	1.087	1.187

Continued

Table 5.3 Continued

Time ratios for explanatory variables	Specification 3 BHPS and FACS	Specification 3 Restricted BHPS	Specification 4 BHPS
Mother's ethnicity:			
White	omitted	omitted	omitted
Black	2.719***	1.967	2.056*
Other non-white	1.233	1.154	1.068
Health problem	0.851*	0.962	0.913
Working partner	1.002	1.291	1.265
Non-working partner	1.259	1.333	1.293
Mother's Prior Work Characteristics			
Weekly hours	0.992***	0.993*	0.991**
Hourly net wage	0.997	1.030**	1.026**
Permanent job	0.863	1.041	1.141
Self-employed	1.502	excluded	excluded
Supervisory role	0.967	1.024	1.047
Firm size	1.000	1.000	1.000
Place of work:			
Business premises	excluded	excluded	omitted
At home	0.842	0.902	1.094
Other	omitted	omitted	1.033
Occupation:			
1. Managers and administrators	omitted	omitted	omitted
2. Professional	1.130	1.210	1.291
3. Associate professional and technical	1.114	1.108	1.107
4. Clerical and secretarial	1.139	1.285	1.319*
5. Craft and related	1.276	1.658**	1.783**
6. Personal and protective services	1.289**	1.490**	1.464**
7. Sales	0.907	1.069	1.104
8. Plant and machine operatives	1.155	0.802	0.879
9. Other	1.313**	1.708**	1.742**
Industry:			
1. Agriculture, forestry and fishing	omitted	omitted	omitted
2. Energy and water supplies	1.239	0.285**	0.326**
3. Extraction/manufacture of minerals and ores	1.413	0.481	0.605
4. Metal goods, engineering/vehicle industry	1.153	0.385**	0.489
5. Other manufacturing	1.640	0.396**	0.479*
6. Construction	1.871	0.311**	0.454
7. Distribution, hotels and catering	1.333	0.387**	0.511
8. Transport and communication	1.429	0.377**	0.504
9. Banking/finance/insurance/business service	1.326	0.348***	0.439*
10. Other services	1.234	0.341***	0.539
Sector:			
Private	excluded	excluded	omitted
Public			0.754**
Other			1.060
Commuting time	excluded	excluded	1.002

Continued

Table 5.3 Continued

Time ratios for explanatory variables	Specification 3 BHPS and FACS	Specification 3 Restricted BHPS	Specification 4 BHPS
Time of day:	excluded	excluded	
During day			omitted
Mornings or afternoons			1.037
Some evenings/nights			0.884
Varies			0.941
Other			0.671**
Experience in months	excluded	excluded	0.998
Experience in months squared			1.000
Tenure in months	excluded	excluded	0.998
Tenure in months squared			1.000
Log likelihood	–1,553.6	–637.6	–629.7
No. of observations	1,244	507	507

Notes: BHPS = British Household Panel Survey; FACS = Family and Children Study. Time ratios significantly different from one at the one per cent level (***), five per cent level (**) and ten per cent level (*). Sibling refers to a sibling of the newborn and not of the mother. All models include controls for unobserved heterogeneity: the null hypothesis of no unobserved heterogeneity was rejected at the one per cent level for all models. The time ratios are significantly different between: black and non-white specification 3 for the BHPS and FACS; working partner and non-working partner in specification 3 for the BHPS and FACS; working mornings or afternoons and other times and working mornings or afternoons and various times for specification 4; industries 4 and 5 and industries 4 and 6 for specification 3 for the BHPS and FACS; occupations 4 and 7 and occupations 5 and 7 in specification 3 for the BHPS and FACS; occupations 3 and 6 for specification 3 with the restricted BHPS sample; occupations 6 and 7 in both specification 3 models; occupations 3 and 9, occupations 5 and 8, occupations 6 and 8 and occupations 8 and 9 in specification 3 for the restricted BHPS sample and in specification 4; occupations 3 and 5 in specification 4; occupations 7 and 9 in all models. The dummy variable for self-employed is excluded from the BHPS-only regressions because net earnings (and thereby net wages) are not recorded for the self-employed in the BHPS. Excluding the variable from specification 3 for the combined FACS and BHPS sample has no qualitative impact on the time ratios. Estimating models with experience and tenure as the sole explanatory variables or with just the demographic variables generated no significant relationships between these variables and the length of maternity leave.

Mothers of newborns who already have older children (older siblings present) have significantly longer absences than those with first newborns: 20 per cent longer on average in the case of one older child and 50 per cent longer in the case of two or more older children (specification 1 in Table 5.2). These differences are greater for lone mothers than for mothers with partners. However, once controls for the mother's prior work are included in the model (specification 2 in Table 5.2), mothers with a single older child actually have significantly shorter absences than those with first-borns. Conditional on being in prior work and controlling for a range of prior work characteristics (specifications 3 and 4 in Table 5.3), mothers of newborns with one older child have, on average, absences from work that are around 70 to 75 per cent of the length for mothers with first births, and mothers with two or more older children have absences that are around 65 per cent of the length for mothers of first-borns. This has important implications for the discussion of whether mothers with

subsequent births return more quickly if they are working prior to the birth than those not working prior to the birth because of their selection (by those with a higher labour market attachment and/or who are more able to combine work and motherhood) or because of a dynamic persistence from working prior to birth. If dynamic persistence was the sole explanation, we would expect that conditioning on prior work and prior work characteristics should mean that mothers of first-borns and those with subsequent births return at roughly the same rate. The fact that this is not the case – and that mothers with subsequent births working prior to birth return significantly more quickly than mothers of first-borns working prior to birth – suggests that the former is a select sample with a greater propensity to work than the first-borns group. If so, then encouraging mothers to return to work after their first birth may not have as large an impact on the length of absence as indicated by the simple differences in return rates between those working prior to birth and those not working.

Mothers with partners who go on to have another child (the younger sibling variable) spend more time out of work than those for whom this future development has not been identified.[37] The gap between siblings is also important for mothers with partners: the longer the gap with either older or younger siblings, the sooner the mother returns to work. The impact of the younger siblings and the gap with the younger sibling continues to hold when controls are included for whether the mother was in work prior to the birth (specification 2), although only the gap with younger siblings is significant when the sample is conditioned on prior work and when prior work characteristics are included (specifications 3 and 4). The impact of the gaps between children may reflect that mothers find it more worthwhile to return to work more quickly if the interruptions of birth are further apart or harder to return if they have more than one young child. Mothers with partners who have multiple births experience significantly longer absences from employment than mothers with single births, but this difference loses its statistical significance once controls for prior work characteristics are included.

Older and more highly educated mothers return to work more quickly than less educated and younger mothers, with greater differences across these groups for lone mothers than for mothers with partners. The age effect is accounted for by related differences in the propensity to be in part-time and full-time work prior to birth, but more highly educated mothers return more quickly even conditioning on prior work (the age time ratio is not significant in specification 2 but the education variables are significant). Conditioning on prior work variables shows that mothers' age and education are not related to the length of absence for the group of mothers working prior to birth, suggesting that it is the interrelationship with the wage and other work characteristics that are driving the differences across age and education for this group.

[37] It is possible to identify that there will be younger siblings using information on subsequent births recorded at later interviews in the panel. Although this information would not have been precisely known to the mother at the time, it captures a measure of future intentions about family formation.

Ethnicity is an important factor in the length of absence and does not appear to be explained by correlations with other demographic or work factors. While black mothers do not appear much different from white mothers in the raw data and even with just controls for demographics, conditioning on prior work variables shows that black mothers take significantly longer absences than their white counterparts once allowance is made for differences in prior work and prior work characteristics. The size of the effect is greater for lone mothers than for mothers with partners: conditioning on whether the mother was in work prior to birth indicates that black mothers with partners have an average length of absence that is more than three times as long as that of their white counterparts, while lone black mothers have a length of absence that is more than four times as long as that of their white counterparts. This ethnic discrepancy is not easily explained: its source could lie in several different factors, such as differences in family or social support and differences in attachment to the labour force or in ethnic discrimination in the labour market.

Women with health problems have significantly longer absences following birth than women not reporting health problems,[38] but this difference disappears once allowance is made for prior work behaviour. Indeed, interestingly, including controls for prior work characteristics for those working prior to birth (specification 3), indicates that the presence of a health problem is correlated with a shorter absence, possibly suggesting that working mothers with health issues have a higher inherent degree of attachment to working than their healthy counterparts.

The differences in the length of absence between mothers with working partners and lone mothers seen in Figure 5.5 are confirmed as significant, although there is no significant difference in the average length of absence between mothers with partners that are not working and lone mothers. Even controlling for whether the mother was working prior to birth, generates an average length of absence for mothers with working partners which is only 63 per cent of the average length for lone mothers (specification 2 in Table 5.2). However, there is no significant difference between those with and without partners once allowance is made for differences in prior work characteristics for women who were working prior to the birth.

For mothers with partners, the length of absence is positively related to the partner's earnings, suggesting that mothers with higher-earning partners may be able to afford to spend more time away from work. If this effect of partner's earnings is indicative of the impact of other sources of income apart from the mother's earnings, this suggests that raising household income following a birth, either through maternity pay, benefits or tax credits, may also lengthen the time spent absent from work following birth. However, the average estimated effect is not

[38] A health problem is defined either as being registered disabled or as 'health limiting type of work' in the BHPS and as a 'long-standing illness or disability' in the FACS.

large for partner's earnings: for every £100 rise in the partner's weekly earnings, the length of the mother's absence rises by just four per cent according to specification 1 or seven per cent according to specification 2. According to the second specification, the length of absence is also significantly negatively related to the partner's hours of work, but the effect is, again, relatively small: the mother's absence is shorter, on average, by six per cent for every additional ten hours that her partner works each week. A priori, it might have been expected that this relationship would work in the opposite direction, with mothers able to return to work sooner if their partner works shorter hours and is more available to provide childcare and other help in the home. On the other hand, partners' hours may reflect local labour demand and so longer hours may be correlated with greater work opportunities for mothers.

Mothers working prior to the birth have significantly shorter absences following birth than mothers who were not working: the average length of absence for mothers previously working part-time is 26 per cent of the average length for those not previously working, while the average length for those working full-time is 22 per cent of that for those not previously working (specification 2 in Table 5.2). Although the difference between prior part-time work and full-time work is small, the difference is significant for all mothers and for mothers with partners. The impact of prior work is greater for lone mothers than for those with partners, but differences between part-time and full-time work are not significant for lone mothers. As already discussed, it is not possible to discern directly whether the relationship between prior work and the length of absence is due to the selection of certain types of mothers both into being in work prior to birth and returning more quickly post-birth or due to a genuine dynamic persistence in working. The fact that the relationship is significant and sizeable in models that contain controls not only for a wide range of measured demographic and family characteristics but also for the possibility of distinct types of women in their propensity to return more quickly (unobserved heterogeneity), does strengthen the case that there is genuine persistence in work participation (such persistence meaning that it is easier for mothers to work after a birth if they were working before the birth, all other things being equal). Hence, while this does not mean that if all women returned to work between births this would reduce the average length of absence to the average duration of those who currently work prior to birth, it could potentially have a sizeable impact on post-birth behaviour.

Specifications 3 and 4 in Table 5.3 consider the impact of prior work characteristics on the length of absence for those who were working prior to birth. Those previously working longer hours have shorter absences, although, on average, only around eight per cent shorter for each additional ten hours worked each week. The mother's hourly net wage is positively related to the length of absence in the BHPS sample, suggesting that the income effect of a higher wage (mothers with higher wages can afford to take a longer break) outweighs the substitution effect of a higher wage (mothers with higher wages return to work more quickly because it is costing them more in foregone earnings). Again, however, the effect is relatively

small: on average, each additional pound in the hourly net wage raises the length of maternity leave by just three per cent. Interestingly, whether the mother was in a permanent job, was self-employed, was in a supervisory role or worked for a large firm and the place of work, are all not significantly related to how quickly the mother returns to work.

Occupation is related to the length of absence: those previously working in craft and related occupations, personal and protective services and 'other' occupations take the longest breaks, while plant and machine operatives and managers and administrators have the shortest breaks. Industry is also important, but there are only significant differences for four types (agriculture, forestry and fishing; metal goods, engineering and vehicle industries; other manufacturing; and construction) and no significant differences between the remaining six categories. The reasons for these differences between occupations and industries are not obvious, particularly as controls for other factors such as wage differences have been included.

According to the BHPS sample, those mothers who previously worked in the public sector have significantly shorter absences from work following birth than those who worked in the private sector: on average, women who were working in the public sector prior to birth have absences that are 75 per cent the length of those for women previously working in the private sector.[39] The earlier return for public sector workers could have several possible explanations: One possibility is that women working in the public sector may be keener to hold onto their previous position and return to work while they are still entitled to their job. Another possible explanation is that public sector jobs may be easier to combine with motherhood. In either case, from a policy perspective, if it were desirable to encourage mothers to return to work sooner, it would be interesting to investigate what particular traits of public sector employment might entice mothers to return to work sooner and could possibly be encouraged in the private sector, where not already present.

Commuting time for those working prior to birth has no significant relationship with the length of absence, but the time of day worked is important. Those who were working mornings or afternoons have longer absences on average, while those working various times of day or 'other' times of day return to work more quickly than other groups. Finally, neither the tenure with employer nor employment experience has any significant relationship with the length of absence. This may initially seem surprising, but it may be explained either by relatively little variation in tenure and experience for women of a similar age just prior to birth or by tenure and experience being related to other factors (such as the wage) that are more directly related to the length of absence.

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[39] It should be noted that this estimate measures the average length of absence for all mothers who worked in the public sector prior to birth relative to all mothers who worked in the private sector prior to birth, regardless of which sector they returned to work in after the birth. Movements between sectors over birth and their relationships to the length of absence from work following birth are analysed in Chapter 7.

Most of these findings are consistent with those in the previous literature, with a few discrepancies. McRae (1993) also reports that having more children is associated with a greater likelihood of an earlier return to work following birth and that those who have not completed their childbearing (there is a younger sibling after the birth in question) have longer absences on average. The finding that younger mothers tend to return more quickly to work following birth (at least when prior work controls are omitted) is consistent with previous similar results (Joshi and Hinde, 1993; Dex *et al.*, 1998), while the contrary conclusion in Hudson *et al.* (2004) can be explained by the unrepresentative sample used in that report. The quicker return for more educated women has also been evidenced in several previous studies (Joshi and Hinde, 1993; Dex *et al.*, 1998; McRae, 1993). The presence of a working partner being associated with a shorter absence from work is consistent with similar findings in McRae (1993) and Hudson *et al.* (2004). The reverse finding in Dex *et al.* (1998) is based on a sample of mothers giving birth in the 1970s and 1980s. The longer average absence for mothers with partners who earn more confirms a similar finding for partner's income in McRae (1993).

Turning to the impact of mothers' prior work characteristics, the association between a higher wage and longer absence reported here is in conflict with previous findings that women with higher wages tend to return more quickly following birth (Dex *et al.*, 1998; McRae, 1991; Hudson *et al.*, 2004). This conflict is likely to be explained by the differences in other variables included in the models; the relationship reported here is conditional on having controlled for a very specific and wide-ranging set of other demographic and prior work characteristics. Nevertheless, it does suggest that rises in the mother's wage, holding all other related factors constant, might encourage a slower return to work.

Differences in the speed of return across different occupations were also highlighted in Hudson *et al.* (2004), who report that women in higher-level occupations tend to have shorter absences than those in other occupations, while the quicker return for mothers working in the public sector is consistent with the same finding in McRae (1993) and Hudson *et al.* (2004). Finally, Hudson *et al.* (2004) report that longer employer tenures are associated with a quicker return for mothers. The analysis here finds this to be true in the simple correlation (see Figure 5.6), but not when controls are included for a wide range of other variables. Furthermore, the sample used in Hudson *et al.* contains only women eligible for statutory maternity leave and pay.

5.3 Maternity rights and employment rates following birth

From a policy perspective, one of the most important issues for the length of absence following birth is the impact of maternity leave and maternity pay rights. These rights aim to protect the employment position of women following the birth of a child and to protect the health and safety of new mothers and new babies. Maternity leave can be defined as the right to return to a particular job within the entitlement period. This may encourage some mothers to return sooner than they would have done in the absence of maternity leave, either because it is simply easier to return to their old

job without the need for job search or application to the position or because they shorten their absence to ensure that they return within the entitlement period and can automatically return to their previous position. On the other hand, maternity leave may encourage some mothers to lengthen their absence (but only within the entitlement period) as they are no longer fearful that a longer absence may reduce the likelihood that they will be able to return to their old position. For both reasons, the right to maternity leave creates an incentive for mothers to return to work around the point of termination of the entitlement period. The presence of maternity pay creates an incentive for mothers to take longer absences from work for two reasons: First, the monetary loss from each month not worked is smaller in the presence of maternity pay (a 'substitution effect').[40] Second, the additional income during absence from work means that the mother can afford to take more time off work (an 'income effect'). It should be noted that the latter effect creates an incentive for the mother to lengthen her absence even beyond the end of the period of maternity pay.

There has been considerable variation in maternity leave rights and maternity pay over the period analysed here (September 1991 to December 2003), both in terms of the qualifying conditions and in the period of entitlements and pay levels. A summary of these changes is presented in Appendix C. For the purposes of this analysis, the sample of mothers with newborns was divided into seven categories of maternity leave and maternity pay entitlements:

1 no entitlements;

2 three to four months' unpaid leave;

3 three to four months' paid Maternity Allowance (MA);

4 three to four months' paid Statutory Maternity Pay (SMP);

5 three to four months' paid SMP and six to seven months' unpaid leave;

6 six months' paid leave (MA or SMP);

7 six months' paid leave (MA or SMP) and 12 months' unpaid leave.

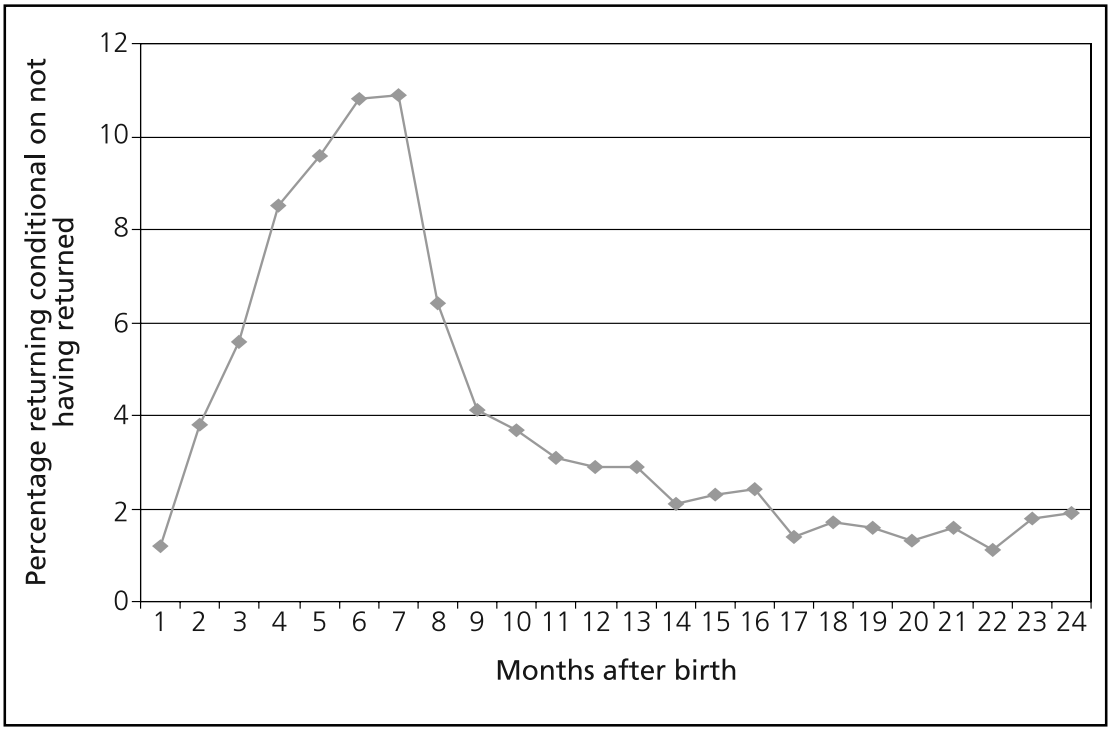
Those in categories (3), (4) and (6) may also be eligible for an identical period of unpaid maternity leave. A full description of the derivation of these categories is provided in Appendix C. An important point to note is that entitlements are not directly observed in the data but the categories are defined by statutory rights derived using the mothers' work histories and employer tenure. Paid leave has been

[40] The presence of maternity pay conditional on not working makes the monetary loss from not working smaller, regard less of the amount of the maternity pay or the amount of earnings forgone. If maternity pay were given to the mother regardless of whether she worked or not, there would be no such substitution effect because her monetary loss from not working would be the same with or without the maternity pay.

divided into MA and SMP where sample sizes permit, as the SMP payment can be considerably higher than the MA payment for the first six weeks of entitlement.

By way of introduction, Figure 5.7 presents monthly hazard rates for returning to work for the entire newborns sample in the first 24 months after birth. The graph shows the percentage of mothers who have not yet returned to work following birth who return in that month (or, equivalently, the probability of returning to work in each month conditional on not having returned before that month).[41] Hazard rates are distinctly higher in months four to seven, with a marked peak at seven months and sizable drops in months eight and nine. From month 14 onwards, the hazard remains around 1–2 per cent. Although the peak in the hazard at six to seven months coincides well with the termination of unpaid maternity leave, this in itself is not evidence of the influence of maternity rights, for six to seven months could simply be a natural time for women to return to work with or without the influence of maternity leave. A comparison between those with entitlements and those without entitlements is required.

Figure 5.7 Monthly hazard rates for returning to work after birth



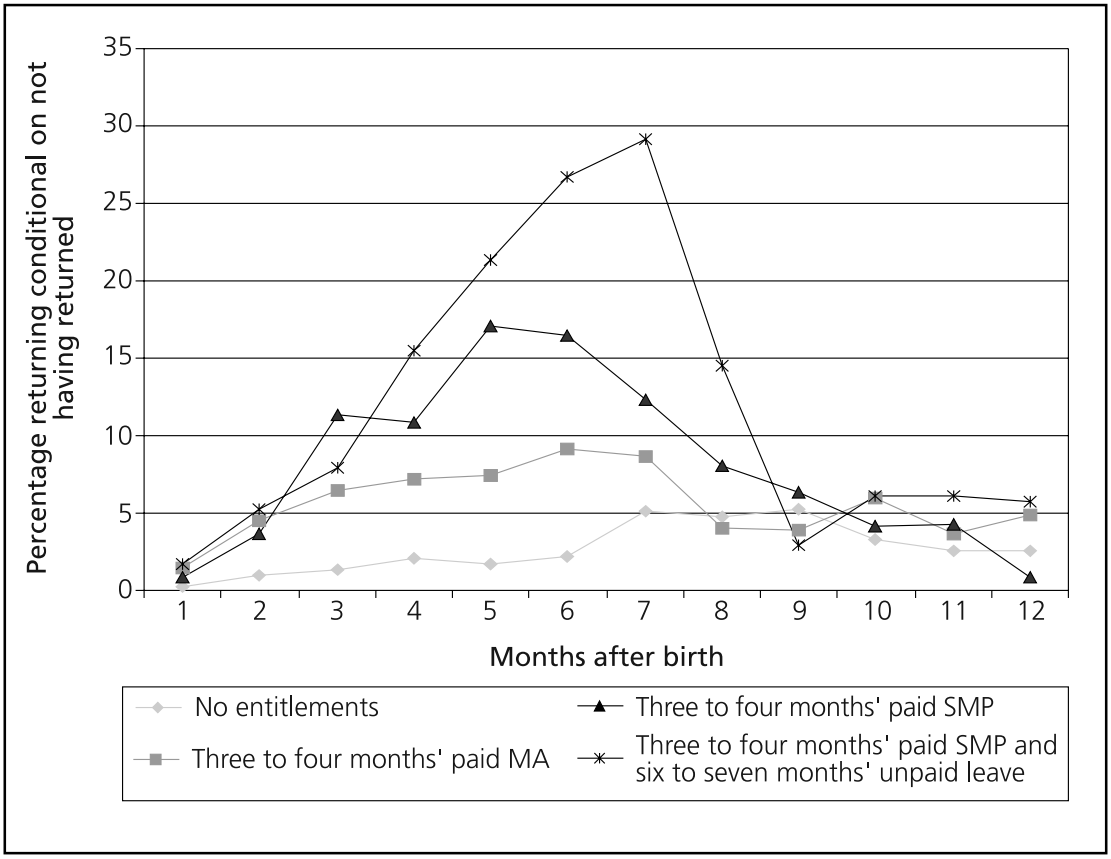
[41] Relative to the survival models presented above, hazard graphs have the advantage of being able to pinpoint bunching in the return rate around certain months, but have the drawback of requiring larger samples to estimate the monthly probabilities accurately. In addition, while survival models cannot pinpoint bunching in the return date, they can be used to estimate the impact of a particular factor on the average length of absence while controlling for other related factors.

Figure 5.8 provides this comparison between those with maternity rights and those not entitled to any statutory maternity leave or pay. Categories (2), (6) and (7) of maternity entitlements have not been included in this graph due to insufficient numbers of observations in these groups to provide accurate hazard rate estimates. Those not eligible for either maternity leave or pay have low rates of return throughout the 12 months, although the probability of return is slightly higher in months seven to nine. Relative to this baseline, all the groups eligible for some type of maternity right have much higher return rates in the first seven months, but there is little difference between all four groups in the propensity to return from nine months after the birth. The difference cannot be attributed solely to differences in maternity rights because entitlement to maternity rights depends on past labour market attachment, and, even in the absence of maternity rights, we would expect women with a strong market attachment to return to work after childbirth faster than women with a weak labour market attachment.

However, the differences in the patterns of returns between the eligible groups are still informative. Those eligible only for three to four months of paid MA exhibit a fairly even distribution in their return rates across the months: there is a peak at six months and a dip at month eight, which may suggest a slight bunching in returning a couple of months after the pay has terminated. Those eligible only for three and four months of paid SMP exhibit a very interesting pattern, with a distinct jump up in the return rate in month three (after the higher rate of pay has terminated at six weeks) and a marked peak in the propensity to return to work in months five and six, the two months following termination of the pay. The relatively high proportion returning in month five could also indicate a desire to return within time to claim the maternity leave rights to return to their previous job, but this would be more likely if followed by a dip in the return rate in month six. Those eligible to both three and four months of paid SMP and six and seven months of unpaid leave have a quite different pattern: there is a jump up in the propensity to return in month four following the termination of the paid leave, but this is overshadowed by the much stronger peaks in months six and seven, marking the end of unpaid maternity leave. The subsequent drop in the propensity to return, particularly in month nine, is indicative that mothers may well be returning to work earlier than they would have done in the absence of the maternity leave right.[42]

[42] Some women start being paid SMP some weeks before the birth, which makes it slightly difficult to infer how many weeks after a birth SMP stops being paid.

Figure 5.8 Monthly hazard rates for returning to work after birth by leave entitlements



Overall, the picture suggests that eligibility for maternity pay is associated with a greater tendency to return in the month or two after termination, consistent with the idea that the presence of maternity pay may enable mothers to afford to extend their absence from work to slightly longer than they would otherwise have done. However, it also suggests that unpaid maternity leave rights have a strong impact, encouraging women both to extend their absence from work to the point of termination of the unpaid maternity leave and, for those who would otherwise have remained absent longer, to shorten their absence to ensure that they benefit from the maternity leave rights to return to their previous job.

From a policy perspective, this is an encouraging finding: the maternity leave and pay entitlements may be enabling some mothers to take the longer maternity leave they desire, while others find the maternity leave rights sufficiently beneficial to return to work earlier in order to benefit from them. It also suggests that increasing the period of entitlements for these rights may well increase the length of time that mothers remain absent from work. However, it should be borne in mind that this may have other effects: longer absences following birth for mothers may mean a greater deterioration in work skills or a decline in mothers' attachment to formal paid work, or employers may view it as more burdensome to employ women likely to take maternity leave. Hence, there is a need to weigh up the potential benefits of mothers being able to spend longer away from work following birth against the potential

drawbacks of longer absences. Some of the impacts of longer absences are analysed in later sections.

The impact of maternity entitlements on the overall length of absence following birth is analysed using the survival models presented in Tables 5.4 and 5.5. As the data requirements are less demanding than they are for the hazard models, these survival models include all seven categories of maternity entitlements. Table 5.4 presents four specifications for all mothers, while Table 5.5 considers the first three specifications disaggregated into mothers with partners and lone mothers. Entitlement categories (6) and (7) included too few observations to be included in the models for lone mothers.

Table 5.4 Length of absence from work: survival models with maternity entitlements

Time ratios for estimated maternity entitlements	Specification 0	Specification 1	Specification 2	Specification 3
(1) No entitlements	omitted	omitted	omitted	omitted
(2) Three to four months' unpaid leave	0.328***	0.332***	0.316***	0.453***
(3) Three to four months' paid MA	0.457***	0.469***	0.603***	0.896
(4) Three to four months' paid SMP	0.364***	0.371***	0.441***	0.534***
(5) Three to four months' paid SMP and seven months' unpaid leave	0.315***	0.325***	0.419***	0.510***
(6) Six months' paid leave	0.398***	0.431***	0.558**	0.704
(7) Six months' paid leave and 12 months' unpaid leave	0.174***	0.181***	0.211***	0.261***
Family background and demographic variables	excluded	included	included	included
Mother's prior work	excluded	excluded	included	excluded
Mother's prior work characteristics	excluded	excluded	excluded	included
Log likelihood	–4,766.9	–4,083.5	–2,297.1	–1,401.7
No. of observations	4,075	3,584	2,086	1,210
Significant differences in time ratios for entitlements	(3) and (4) (4) and (5)	(5)(7) and all others except (2) in spec. 2		(2) and (3)

Notes: Time ratios significantly different from one at the one per cent level (***), five per cent level (**) and ten per cent level (*). All models include controls for unobserved heterogeneity: the null hypothesis of no unobserved heterogeneity was rejected at the one per cent level for all models. The family background and demographic variables, mother's prior work and mother's prior work characteristics are the same as those in the survival models in Tables 5.2 and 5.3.

Table 5.5 Length of absence from work: survival models with maternity entitlements for mothers with partners and lone mothers

Time ratios for estimated maternity entitlements	Mothers with partners			Lone mothers		
	Specification 0	Specification 1	Specification 2	Specification 0	Specification 1	Specification 2
(1) No entitlements	omitted	omitted	omitted	omitted	omitted	omitted
(2) Three to four months' unpaid leave	0.327**	0.356***	0.311***	0.293**	0.333*	0.298
(3) Three to four months' paid MA	0.474***	0.462***	0.579***	0.542***	0.537***	0.671
(4) Three to four months' paid SMP	0.388***	0.393***	0.458***	0.251***	0.265***	0.394***
(5) Three to four months' paid SMP and seven months' unpaid leave	0.353***	0.354***	0.425***	0.153***	0.179***	0.340***
(6) Six months' paid leave	0.359***	0.388***	0.502***	excluded	excluded	excluded
(7) Six months' paid leave and 12 months' unpaid leave	0.196***	0.204***	0.222***	excluded	excluded	excluded
Family background & demographic variables	excluded	included	included	excluded	included	included
Mother's prior work	excluded	excluded	included	excluded	excluded	included
Log likelihood	–4,111.0	–3,600.5	–2,062.6	–810.8	-659.6	–245.5
No. of observations	3,489	3,081	1,800	806	704	331
Significant differences in time ratios for entitlements	(3) and (5)(7) and all others except (2) and (3)		(2) in spec. 2	(4) and (3) (5)	(3) and (5)	

Notes: Time ratios significantly different from one at the one per cent level (***), five per cent level (**) and ten per cent level (*). All models include controls for unobserved heterogeneity: the null hypothesis of no unobserved heterogeneity was rejected at the one per cent level for all models except specification 2 for lone mothers which did not reject the null hypothesis. Lone mothers with entitlements in categories (6) and (7) were dropped from the analysis. The family background and demographic variables and mother's prior work are the same as those in the survival models in Table 5.2.

Those entitled to maternity rights have significantly shorter average absences from work following birth than those without any entitlements. With the exception of categories (3) and (6) in specification 3, the length of absence remains significantly shorter even when controls are included for family background and demographic variables and a host of mother's prior work characteristics, although the magnitudes of the differences are reduced. The inclusion of these controls suggests that it is not observable differences in family background or work characteristics that are driving both eligibility for maternity rights and shorter absences among some types of mothers. However, it should be noted that the qualifying conditions for most of the maternity entitlements (see Table C.1) require a high degree of labour market attachment, which may not have been completely captured in the set of controls but may, nevertheless, be driving both the eligibility for maternity rights and the shorter absence for some types of women. Hence, these results cannot be interpreted as suggesting that maternity entitlements considerably shorten the length of absence following birth, but are more likely to be reflecting the fact that mothers who are entitled to maternity leave and pay are of the type who tend to have shorter absences following birth than those without any entitlements.[43]

The differences in the average length of absence within different entitlement types are more enlightening. Somewhat surprisingly, the group with the shortest average absence is category (7), which has the most generous entitlements, of six months' paid leave and 12 months' unpaid leave. However, this strange result is likely to be due to the fact that these entitlements were only introduced in April 2003 and the length of absence for this group is censored at ten months. Within the remaining entitlements, those eligible only for maternity pay (categories (3), (4) and (6)) tend to have longer absences than those also, or only, entitled to maternity leave (categories (2) and (5)). This is consistent with the theory that maternity leave rights create incentives for some mothers to lengthen their absence and for other mothers to take shorter absences than they would have done in the absence of these rights, while entitlement to maternity pay can only encourage mothers to extend their absence.[44] From a policy perspective, it should be noted that maternity leave rights tend to encourage a particular length of absence, while extensions to, or increased generosity of, maternity pay may lengthen the period of absence to an unspecified degree.

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[43] The controls for unobserved heterogeneity in the survival models do not appear to be fully capturing this effect. To measure the impact of maternity entitlements accurately would require, ideally, data collected from a random experiment (natural or as part of a programme) that would assign mothers to maternity entitlements independently of their previous work behaviour and labour market attachment.

[44] The differences in qualifying conditions across different types of entitlements are not so great as to cause concern about selection into different types of women with varying degrees of labour market attachment. In addition, there is no straightforward correlation between the stringency of qualifying condition and length of absence. For example, group (2) has the 'easiest' qualifying condition but one of the shortest average lengths of absence.

Disaggregating the survival models by partnership generates patterns for mothers with partners and for lone mothers (Table 5.5) that are very similar to the aggregate picture. However, most of the time ratios for the entitlements are smaller for lone mothers than for those with partners, indicating a stronger relationship between the length of maternity absence and maternity rights. This may be indicative that lone mothers who are eligible for maternity entitlements are an even more select group in terms of their labour market attachment than mothers with partners.

These estimated impacts of maternity entitlements on the length of absence following birth are broadly consistent with those reported in previous studies. Some studies have highlighted how entitlements to maternity leave or pay are associated with a greater likelihood that mothers will return to work within the first year (Waldfogel *et al.*, 1998; McRae, 1993), while others have shown that mothers have a tendency to return to work either when the period of paid leave ends or when the period of unpaid leave ends if it is longer and the mother can afford to continue beyond the paid period (Burgess *et al.*, 2002; Hudson *et al.*, 2004). While the former of these two studies suggests that it is the period of unpaid leave that is most influential in determining how long mothers take to return to work, the second study gives greater emphasis to the paid period as being the crucial factor.

In contrast to previous work, the findings presented here have evidenced two new processes: first, that maternity pay may allow women to be able to afford to extend their absence even beyond the termination of the period of maternity pay; and second, that maternity leave may encourage some women to shorten their absence in order to be eligible for the associated rights. Hence, both the duration and **generosity** of maternity pay will determine its impact on the length of mothers' absences by determining how long mothers can afford to remain away from work, but the length of maternity leave and the termination of its associated rights may constrain some women to return earlier than they would otherwise have done. In terms of future policy development, the evidence does not show whether maternity leave or maternity pay is the more influential on mothers' length of absence following birth. In reality, the influence of either is determined by how the two combine, given an individual woman's circumstances.

5.4 The permanency of return to work following birth

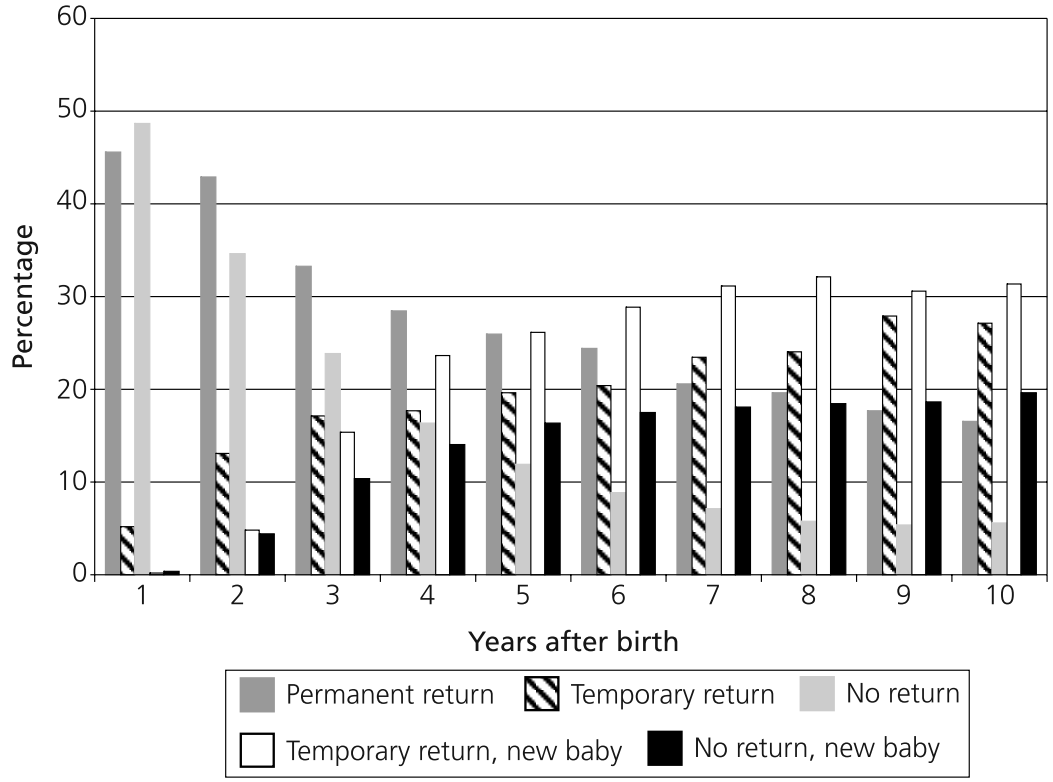
Although mothers may return to formal paid work quickly after birth, they may not remain permanently in employment. Aside from natural fluctuations in employment, many new mothers may soon face the interruption of a subsequent birth. Even in the absence of further children, combining work and motherhood is always a new experience for first-time mothers (and often a new one for mothers of subsequent children) and some may return to formal work only to discover that it is not the best choice. In addition, child-related demands or the pleasure of being a full-time carer may change as the child grows, inducing some mothers to switch out of work as the child ages.

The permanency of the return to employment is highlighted in Figure 5.9. The graph shows that the return to work after birth is often temporary or interrupted by a subsequent birth. Ten years after birth, 51 per cent of mothers have had a subsequent birth, 17 per cent have permanently returned, 27 per cent have temporarily returned and five per cent have not returned at all.[45] It is insightful to compare these numbers with those for men in the ten years following birth: 53 per cent have partners who have had a subsequent baby, 27 per cent have worked permanently, 18 per cent have been both in and out of work (equivalent to a temporary return) and two per cent have not worked at all (equivalent to no return). This means that while 38 per cent of mothers who have returned to work within ten years and have not had a subsequent birth have remained permanently in work, some 61 per cent of men in the same position have remained permanently in work. This suggests that even if mothers return to work after birth and have no subsequent children, the chances that they will remain in work is much lower than would be expected from normal labour market dynamics. Hence, policy initiatives aiming to enhance the work participation of mothers, need to focus not just on encouraging them to return to work following the birth, but also on ensuring that they remain in work.

Figure 5.10 disaggregates the picture by first and subsequent births. Not surprisingly, subsequent births are less likely than first births to be followed by another birth. Less obviously, subsequent births are more likely than first births to be followed by no return or a temporary return to work than a permanent return. Indeed, considering the proportions at ten years after birth shows that 43 per cent of mothers of first births who have returned within the ten years and not had a subsequent birth have returned permanently to work, but only 37 per cent of mothers of subsequent births in the same position have permanently returned to work. This may reflect the fact that it is easier for mothers to remain in work with a single child than with more than one child.

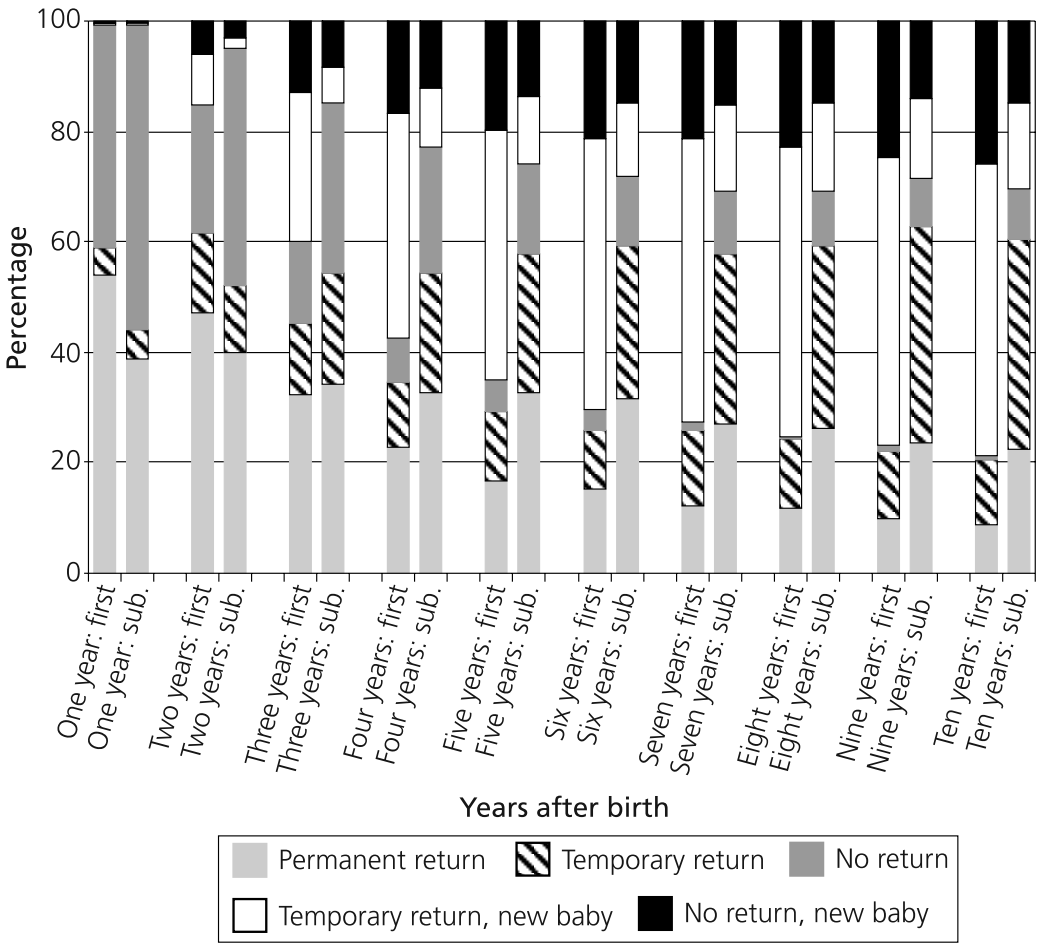
[45] A temporary return is defined as one where the mother has worked since the birth but has also reported a spell out of work since returning to work. A permanent return is one where the mother has reported only spells of work since the initial return to work. By definition, the advent of a new baby means that a return cannot be permanent.

Figure 5.9 Permanent and temporary return to work and subsequent births



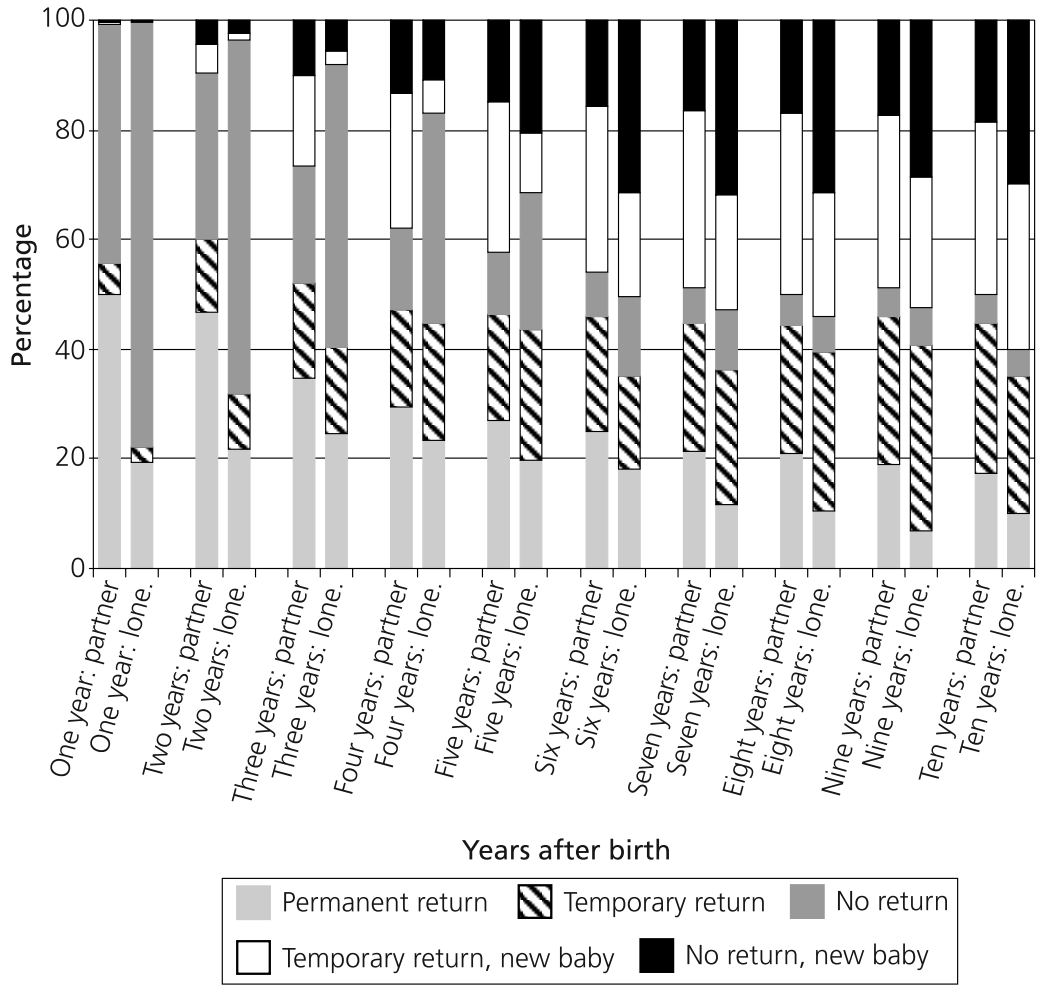
Notes: A temporary return is defined as one where the mother has worked since the birth but has also reported a spell not in work since returning to work. A permanent return is one where the mother has reported only spells of work since returning to work.

Figure 5.10 Permanent and temporary return to work and subsequent births by first and subsequent birth



Notes: A temporary return is defined as one where the mother has worked since the birth but has also reported a spell not in work since returning to work. A permanent return is one where the mother has reported only spells of work since returning to work.

Figure 5.11 Permanent and temporary return to work and subsequent births by partnership



Notes: A temporary return is defined as one where the mother has worked since the birth but has also reported a spell not in work since returning to work. A permanent return is one where the mother has reported only spells of work since returning to work.

Figure 5.11 presents the picture for mothers with partners and lone mothers. The two types of mothers are quite distinct for the first five years following birth, but the differences narrow thereafter. In particular, lone mothers are less likely to have a subsequent birth and are more likely not to have returned to work at all within the first five years after birth. The narrowing in these differences after five years may reflect a degree of repartnering by lone mothers (the mother's partnership status is defined at the time of birth throughout the graph). However, even in the longer run, the likelihood that a return to work is permanent is greater for mothers with partners than for lone mothers: at ten years after birth, 39 per cent of mothers with partners who have returned within the ten years and not had a subsequent birth have returned permanently to work, while only 29 per cent of similar lone mothers have permanently returned to work.

The discussion of maternity leave entitlements in Section 5.3 raised the issue of the longer-term impacts of altering the length of absence from work for women following childbirth. One important question for this discussion is whether longer absences from work are associated with less work participation in the future, either through weakening the mother's attachment to the labour market or by reducing her opportunities through the deterioration of work skills during the absence. The relationship between the length of absence and the likelihood of being at work in the longer term is investigated in Table 5.6.

Table 5.6 presents a key result from each of 40 separate regressions for the likelihood of a woman being in work at the second to the ninth interview after birth. For each interview, five different specifications have been estimated, with increasing numbers of explanatory variables to control for the possible interrelationships with other factors. The number in each cell of the table presents the coefficient on the variable measuring the length of absence following birth, with the standard error associated with that estimate in parentheses and the sample size for the regression below that.[46] The asterisks indicate where there is a statistically significant relationship between the length of absence and the likelihood that women are in work at each interview.[47]

[46] It should be noted that the length of absence variable can only contain uncensored observations and the sample for each interview only contains women who have returned to work prior to that interview.

[47] Coefficients are not presented for variables other than the length of absence as they capture the same cross-sectional relationships presented extensively elsewhere and contained no unusual estimates.

Table 5.6 Probability in work by interview since birth: effect of length of absence from work following birth

Coefficient on variable for the length of absence from work following birth (standard error) n = sample size	Number of interviews (years) since birth							
Additional regressors	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
None	0.069**	–0.022*	0.007	–0.014**	0.002	–0.005	–0.003	–0.000
	(0.029)	(0.012)	(0.010)	(0.006)	(0.005)	(0.004)	(0.004)	(0.004)
	n = 1,608	n = 1,338	n = 979	n = 922	n = 853	n = 785	n = 682	n = 579
Family background: number of children, age of youngest child, age, education, ethnicity, health problem, partner, whether partner working, partner's work hours, partner's earnings	0.089*	0.000	0.021*	–0.012	0.007	–0.001	0.004	0.002
	(0.046)	(0.017)	(0.012)	(0.008)	(0.007)	(0.006)	(0.005)	(0.005)
	n = 740	n = 755	n = 702	n = 666	n = 631	n = 584	n = 519	n = 439
Family background: as above Prior work characteristics: weekly hours, permanency, self-employed, supervisory position, sector, firm size, place of work, commuting time, time of day worked	0.109	0.002	0.016	–0.007	–0.001	–0.016	0.020	–0.008
	(0.071)	(0.029)	(0.022)	(0.016)	(0.014)	(0.015)	(0.014)	(0.011)
	n = 390	n = 446	n = 397	n = 347	n = 297	n = 244	n = 195	n = 150
Family background: as above Prior work characteristics: as above Prior occupation and industry	0.100	0.005	0.023	–0.003	0.004	–0.013	0.024	–0.018
	(0.193)	(0.031)	(0.023)	(0.018)	(0.016)	(0.019)	(0.017)	(0.014)
	n = 381	n = 438	n = 384	n = 338	n = 287	n = 236	n = 194	n =141
Family background: as above Prior work characteristics: as above Prior occupation and industry Prior employment experience and employer tenure (quadratic)	0.514***	0.041	–0.005	0.000	0.014	–0.008	0.083*	–0.018
	(0.190)	(0.052)	(0.032)	(0.024)	(0.020)	(0.024)	(0.049)	(0.028)
	n = 180	n = 266	n = 247	n = 220	n = 213	n = 176	n = 149	n = 109

Notes: Coefficients are significantly different from zero at the one per cent level (***), five per cent level (**) and ten per cent level (*). Models for the tenth interview after birth and beyond had insufficient sample sizes to be estimated.

In spite of this rigorous attempt to identify some relationship between the length of absence and the probability of working in the future, table 5.6 does not provide any convincing evidence of a strong correlation. There are significantly positive coefficients in three of the specifications for the second interview since birth, suggesting that a longer absence is associated with a greater probability that the woman will be in work at this time. However, as the second interview since birth will often be very close to the initial return to work after birth, this may indicate that those with longer absences within this short period have simply had less time to leave work again. In the models without any controls (the first row), there are significantly negative coefficients at the third and fifth interviews since birth, suggesting that longer absences following birth are associated with a lower probability of women being in work at these points in time. However, there is no evidence of this relationship at later interviews or in the models that control for the interrelationships with other factors. This may result from the fact that the sample size falls as controls are added or as the interviews are further from the birth, meaning that any effect cannot be identified with precision, or it may reflect a genuine correlation which only persists as far as the fifth interview but can be accounted for by other observable factors. In either case, it must be concluded that there is no evidence that the length of absence following childbirth affects the likelihood of mothers working in the first decade after birth.

Previous studies have concluded that those who return more quickly are likely to remain in the job for longer (Macran *et al.*, 1996) or are more likely to be working at a subsequent date (Joshi *et* al., 1996; Dex *et al.*, 1998). All three studies are based on the same survey of women aged 33 in 1991 with births in the 1970s and 1980s. There are at least three ways of explaining the discrepancy: First, if the results reported here are true, it may reflect that there used to be a relationship but that it has changed over time. Second, the analysis here has controlled for a wide range of other factors that might affect women's propensity to work. Finally, the differences may be explained by the fact that the three previous studies measured the length of return as simply whether the mother had returned within eight or nine months of the birth (doing so was the exception rather than the rule in the 1970s and 1980s), rather than the continuous measurement of the length of time between birth and returning to work used here.

5.5 Employment changes for women with children entering school

A second potentially critical time in women's employment is when a child starts compulsory schooling at age four or five. As already described, this may affect the mother's employment choices by effectively providing free and compulsory alternative childcare to the mother for a considerable portion of the day or by introducing new demands from school life for the mother.

In tracking the impact of school entry on mothers' employment participation, five points in time around school entry are considered: the June prior to school entry, the

September at the likely point of school entry, the January and April marking the start of new terms within the first school year and the following September when the child is embarking on their second academic year in school. The initial June and final September mark clear comparisons prior to and post school entry, while the intervening points allow consideration of the speed of changes.

As the potential impacts of school entry on mothers' employment can have opposing influences, it is important not only to analyse the aggregate change in behaviour, but also to consider the underlying turnover in work participation. The top panel in Table 5.7 presents the aggregate picture, while the lower two panels focus on the turnover aspect.

Table 5.7 Changes in mothers' employment with school entry

	Partnership		Child order			
	With partner	Lone mother	Last child	First child	Middle child	All
Percentage in work:						
in previous June	57.3	37.0	60.4	50.9	34.9	53.3
in September	57.1	35.7	61.1	50.0	32.8	53.1
in January	58.1	36.4	62.8	50.0	32.1	53.8
in April	59.4	37.7	64.1	51.3	32.8	55.0
in following September	60.4	41.7	66.9	50.8	35.5	56.7
Percentage of those **not working** in previous June who are working:						
in September	9.2	4.6	10.9	6.9	4.1	8.1
in January	17.0	10.2	19.2	14.2	8.7	15.2
in April	21.0	11.9	22.9	18.0	10.6	18.5
in following September	27.5	18.4	32.0	22.4	15.6	25.2
Percentage of those **working** in previous June who are working:						
in September	95.2	90.8	96.2	94.4	88.5	94.8
in January	91.5	84.1	93.9	87.7	79.3	90.5
in April	90.8	84.5	93.8	86.8	77.6	90.0
in following September	89.4	84.8	93.4	83.3	78.9	88.9

Notes: Last child is a child entering school with no younger siblings; first child is a child entering school with younger siblings but no older siblings; and middle child is a child entering school with both older and younger siblings.

Some 53 per cent of mothers are reported as being in work in the June prior to school entry (final column, first row of Table 5.7). This aggregate proportion has barely altered in the September at the point of school entry or in the following January, but has risen to 55 per cent by the following April and to 57 per cent in the September post-school entry. The proportions of mothers with partners and lone mothers who work follow a similar pattern, although lone mothers start from a lower base in June (37 per cent compared with 57 per cent in work) and experience a slightly greater increase (of nearly five percentage points rather than three percentage points). The

differences are more dramatic across the order of the child entering school: the work rate for mothers with their last child entering school rises by 6.5 percentage points compared with virtually no change for mothers with a first or middle child entering school. On the aggregate level, therefore, it appears that school entry may be a critical time only for mothers with their last child entering school. However, given the argument of some recent policy debate that mothers should be able to undertake formal paid work once their youngest child starts school, this increase in work participation of 6.5 percentage points over the period of school entry may seem surprisingly small.

The middle panel of Table 5.7 presents the proportions of mothers who were not in work in the June prior to school entry who move into work during the following school year, while the bottom panel shows the proportions of mothers who were working in the June prior to school entry who are still working in the following school year. For all mothers, some 25 per cent of those initially not working have moved into work by the September following school entry, and some 11 per cent of those initially working have moved out of work over the same period. The smallest changes occur in the April following school entry. Hence, the aggregate increase in work participation of three percentage points between the prior June and the subsequent September masks the fact that some 18 per cent of mothers switched between working and not working over this period.[48]

For lone mothers, the proportions of those not originally in work who move into employment are smaller than those for mothers with partners, while the proportions of those originally in work who move out are bigger.[49] Turnover for both types of mothers is similar: 17.8 per cent of mothers with partners switch between working and not working between the June prior to school entry and the subsequent September, while 17.2 per cent of lone mothers switch. As might be expected, the greatest proportions entering work and the smallest fractions leaving work are for mothers with a last child entering school rather than those with first or middle children entering. Interestingly, although the aggregate proportions of mothers working alter little for the latter two groups, there is considerable turnover for the groups: some 22 per cent of initially non-working mothers with a first child are in employment in the September following school entry, while 17 per cent of those initially working have moved out of work over the same period. Indeed, the proportion of mothers who switch between working and not working between the June prior to school entry and the subsequent September is even slightly higher for those with a first child (19.5 per cent) than for those with a middle child (17.5 per cent) or last child (16.7 per cent). Hence, while school entry may appear to be a

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[48] The 18 per cent figure is calculated using the facts that 53.3 per cent of mothers are in work in the June and that 25.2 per cent of those not working and 11.1 per cent of those working change their work status.

[49] This is consistent with there being a greater percentage point net increase for lone mothers because the initial balance between working and not working is very different for mothers with partners and lone mothers.

critical period only for mothers of last children according to the aggregate statistics, examination of the underlying transitions suggests that it may be a critical period in both directions for a substantial proportion of mothers. Whether these transitions are unusually high relative to other periods will be examined below in Section 5.6.

In order to determine which types of mothers are more likely to move into or out of work over school entry, probability models were estimated for the likelihood of the transition. The results are presented in Table 5.8. The first column presents the results from a model estimating the probability of being in work in the September subsequent to school entry for the sample of mothers not working in the June prior to school entry. The second and third columns present the results from models estimating the probability of being in work in the September subsequent to school entry for the sample of mothers who were working in the June prior to school entry. The second specification of these two models includes variables for mother's prior work hours, measured not in the initial June but at the previous interview when the weekly hours were measured. Hence, this sample includes some mothers working in the initial June who were not in work at the previous interview.

The significant factors related to movements between work and non-work over school entry are marked by the starred coefficients in Table 5.8. However, an easier way to understand the magnitude of the relationships is through the predicted probabilities either of moving into work for those initially not working or of remaining in work for those initially working. These predicted probabilities for different values or categories of the significant factors are presented in Figures 5.12 and 5.13. In each case, the graphs show the predicted probability assuming that all other factors are held at their observed value. For example, the first bar in Figure 5.12 shows the proportion of non-working mothers that would move into work over school entry if all children were last children, while the next bar shows the proportion if all children were first children and the third bar if all children were middle children.

Table 5.8 Logit models for the probability of employment in September following school entry

Coefficients for explanatory variables	Not working in June prior to school entry	Working in June prior to school entry	
	Specification 1	Specification 1	Specification 2
Multiple entry	0.144	excluded	excluded
Last child	omitted	omitted	omitted
First child	–1.270***	–0.490***	–0.314
Middle child	–1.255***	–1.109***	–0.921**
Months gap with:			
older sibling	excluded	–0.020*	–0.031**
younger sibling	0.011**	–0.003	–0.002
Mother's age	–0.018	0.093***	0.067***

Continued

Table 5.8 Continued

Coefficients for explanatory variables	Not working in June prior to school entry Specification 1	Working in June prior to school entry Specification 1	Specification 2
Mother's education:			
1. No qualifications	omitted	omitted	omitted
2. NVQ 1/<GCSE	–0.169	–0.311	–0.537
3. NVQ 2/GCSE	0.375*	–0.111	–0.382
4. NVQ 3/A level	0.626***	–0.089	–0.034
5. NVQ 4–5/higher	0.835***	–0.059	–0.490
Mother's ethnicity:			
White	omitted	omitted	omitted
Black	–2.211**	–0.035	–0.155
Other non-white	–0.749*	–0.756*	–1.021*
Health problem	–0.865***	–0.621**	–0.670**
Working partner	0.796**	0.800	0.026
Non-working partner	–0.729***	–0.081	–0.347
Partner's earnings	–0.001***	–0.001**	–0.001
Partner's work hours	0.011	0.003	0.011
Mother's prior work:	excluded	excluded	
Not working			omitted
Part-time			1.021***
Full-time			1.433***
Log likelihood	–639.1	–415.3	–283.75
Number of observations	1,258	1,381	909

Notes: Coefficients are significantly different from zero at the one per cent level (***), five per cent level (**) and ten per cent level (*). Sibling refers to a sibling of the child entering school and not of the mother. In the model conditioned on not working in the June prior to school entry, the coefficients on educ2 and educ3, educ2 and educ4, educ2 and educ5, educ3 and educ5, and working partner and non-working partner were significantly different. In the two models conditioned on working in the June prior to school entry, the coefficients on first child and middle child were significantly different from each other. The months gap with older sibling was excluded from the first model because the zero value predicted failure perfectly. The multiple entry variable was excluded from the other two models because the zero value predicted success perfectly. The mother's prior work is at the previous interview when hours were recorded. The models could not be divided into mothers with partners and single mothers due to insufficient sample sizes. The models could also not be estimated with prior work variables for the mothers due to insufficient sample size.

Figure 5.12 Predicted proportions working in September following school entry: mothers not working in prior June

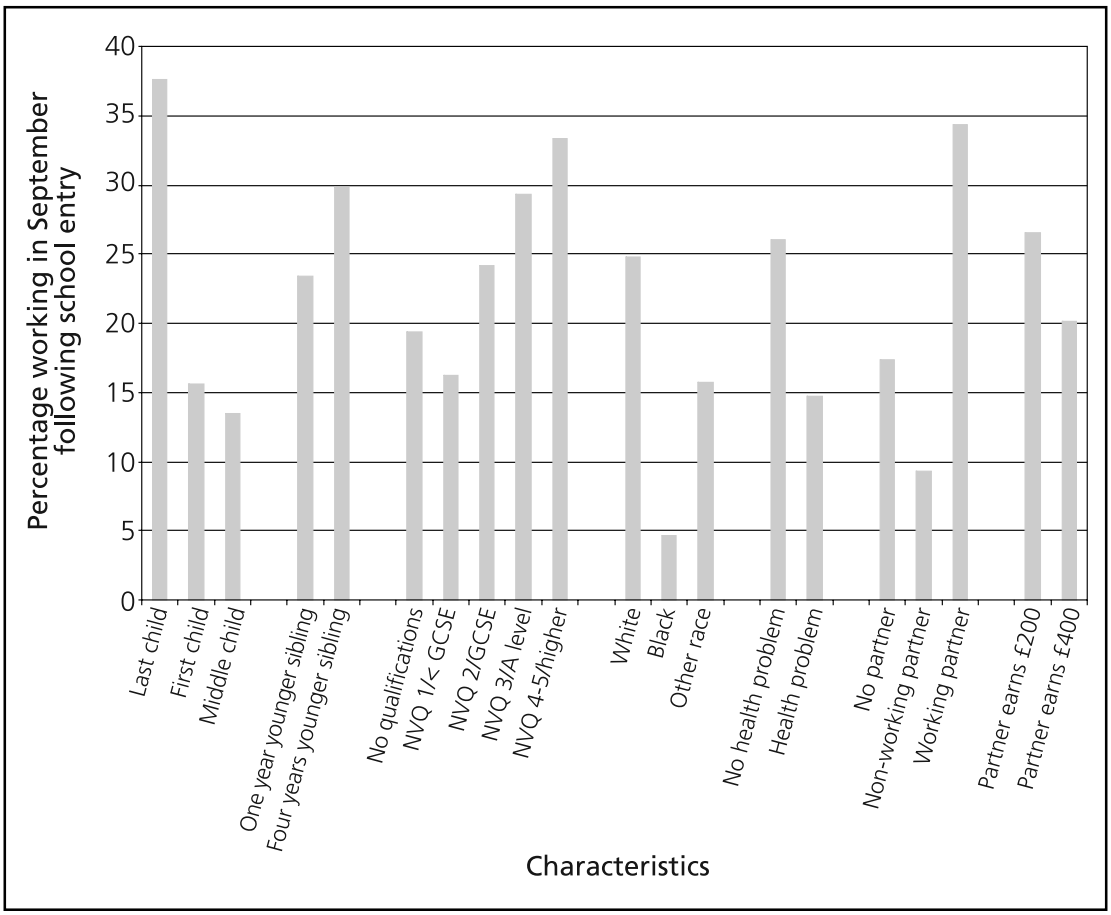
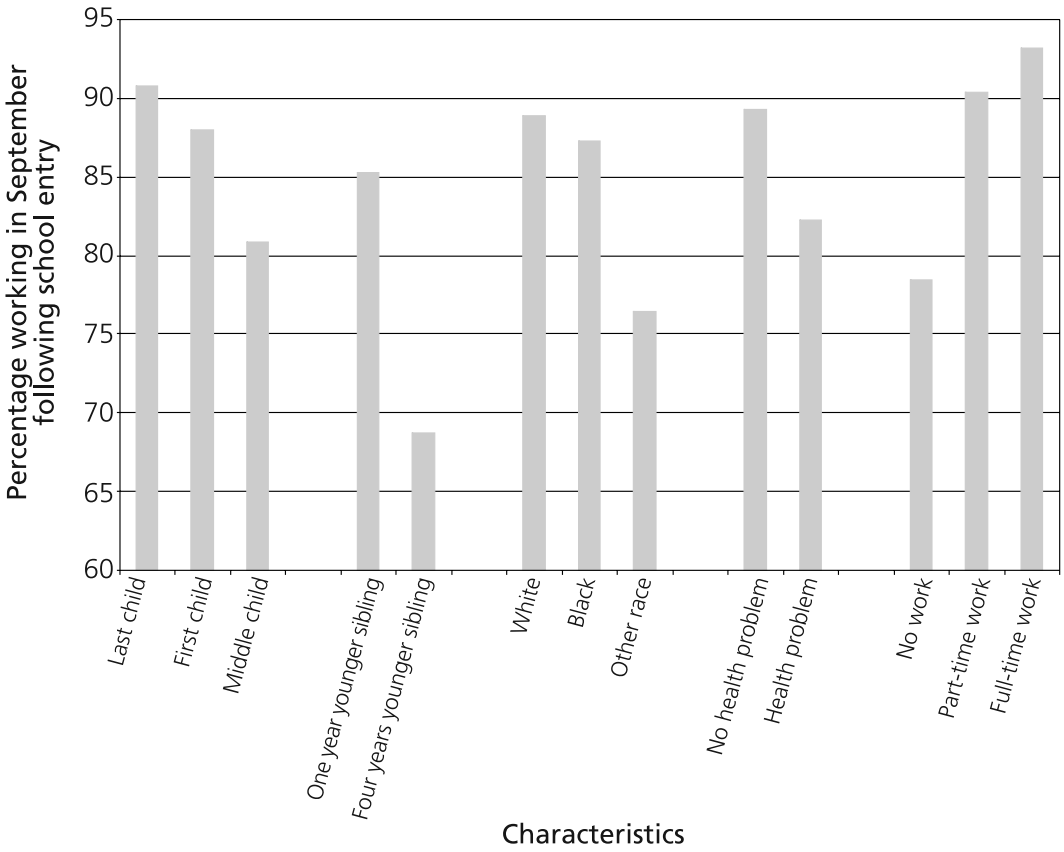


Figure 5.13 Predicted proportions working in September following school entry: mothers working in prior June



Note: This graph corresponds to specification 2 in Table 5.8.

The initial three bars in Figure 5.12 show that controlling for differences in other factors means that mothers with last children are even more likely to move into work over school entry than those with first or middle children than the numbers in the raw data suggested. This movement may arise from the fact that mothers of last children entering school suddenly have completely child-free time during school hours without any need for additional childcare. Mothers with a larger gap between the school-entry child and younger children are more likely to move into work, although the differences are not large, possibly due to opposing effects: on the one hand, those with a larger gap have potentially more years of needing childcare for the younger child if they work, while, on the other hand, those with a short gap may be prepared to wait until all children are in school before returning to work.

Mothers with higher levels of education are generally more likely to return to work, while white mothers are more likely to return than mothers of other ethnic groups. As prior work characteristics cannot be included in these models, both of these relationships may reflect a wage effect, although ethnicity has remained an important factor in models presented above (Table 5.3) even with wage controls included. It is not surprising that mothers without health problems are significantly more likely to return to work over school entry, while the fact that those with a working partner are much more likely to return may reflect a correlation in work opportunities between mothers and their partners.[50] Interestingly, the same correlation could explain why mothers with non-working partners are significantly less likely than lone mothers to return to work over school entry. Finally, mothers with higher-earning partners are less likely to return to work, although the effect is not large: at the observed values for other factors, an increase in partner's earnings from £200 to £400 reduces the likelihood from 26 per cent to 20 per cent. As mentioned in Section 5.2, in the context of the relationship between partner's earnings and mother's work participation, this has implications for maternity pay, benefits or tax credits paid to families: subsidising the income of families could reduce the propensities of mothers to return to work.[51]

Slightly fewer factors are related to the probability that mothers working in the June prior to school entry are still in work in the subsequent September (Figure 5.13). Child order has a similar but smaller impact on the propensity to be in work, while, curiously, a larger gap with an older sibling makes it less likely that the mother will remain in work. Once again, mother's ethnicity is important, but only those in the 'other race' category have a lower probability of remaining in work than white mothers. The Mothers' health has the anticipated effect, as does not working at the interview previous to the June prior to school entry. Interestingly, whether the mother was working full-time or part-time at this interview has no impact on the likelihood that she will remain in work over school entry.

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[50] This correlation could either be in individual characteristics such as work experience or training or in the local labour market conditions.

[51] No judgement is implied about whether this is a good or a bad outcome.

5.6 Are newborns and new schools critical points in women's employment?

Having considered in detail the impact of newborns and school entry on employment participation for women, this section compares the changes at these critical times with those for women at other points in family formation and with those for men at the same critical points. Figure 5.14 charts the propensity of those not currently in work to be in work two interviews later for men and women across the seven groups of family formation and development. Figure 5.15 presents the corresponding picture for the proportion of those currently in work who are not in employment two interviews later.

Figure 5.14 Percentage moving into work over two years

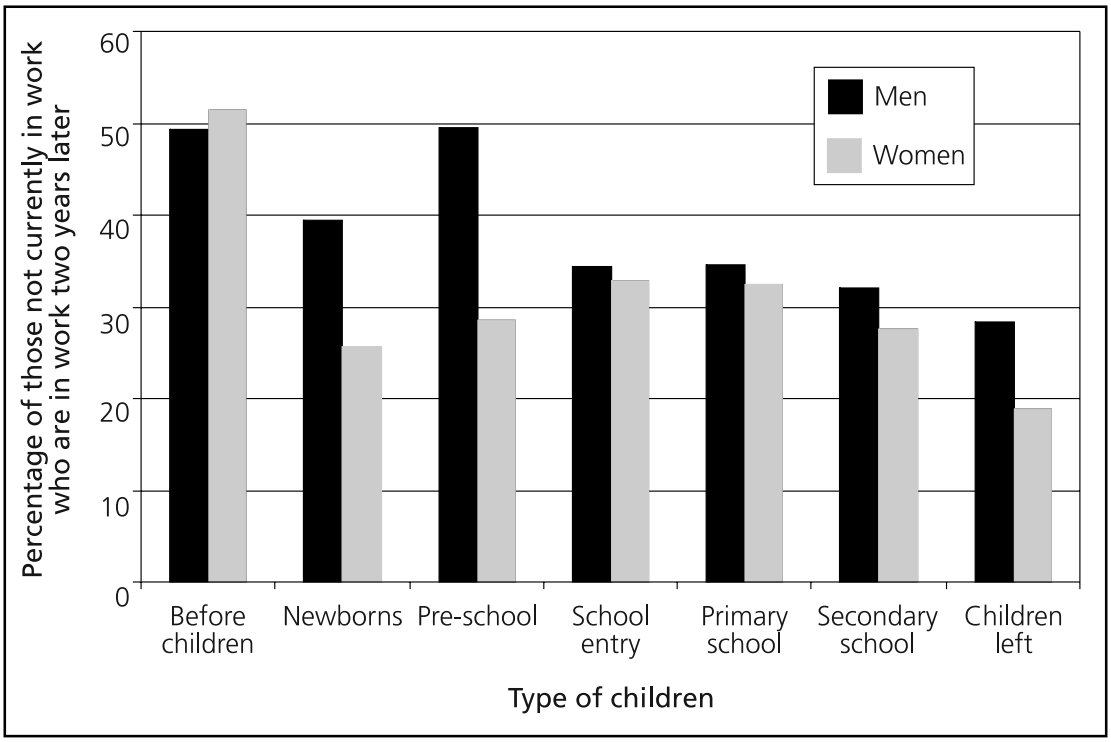
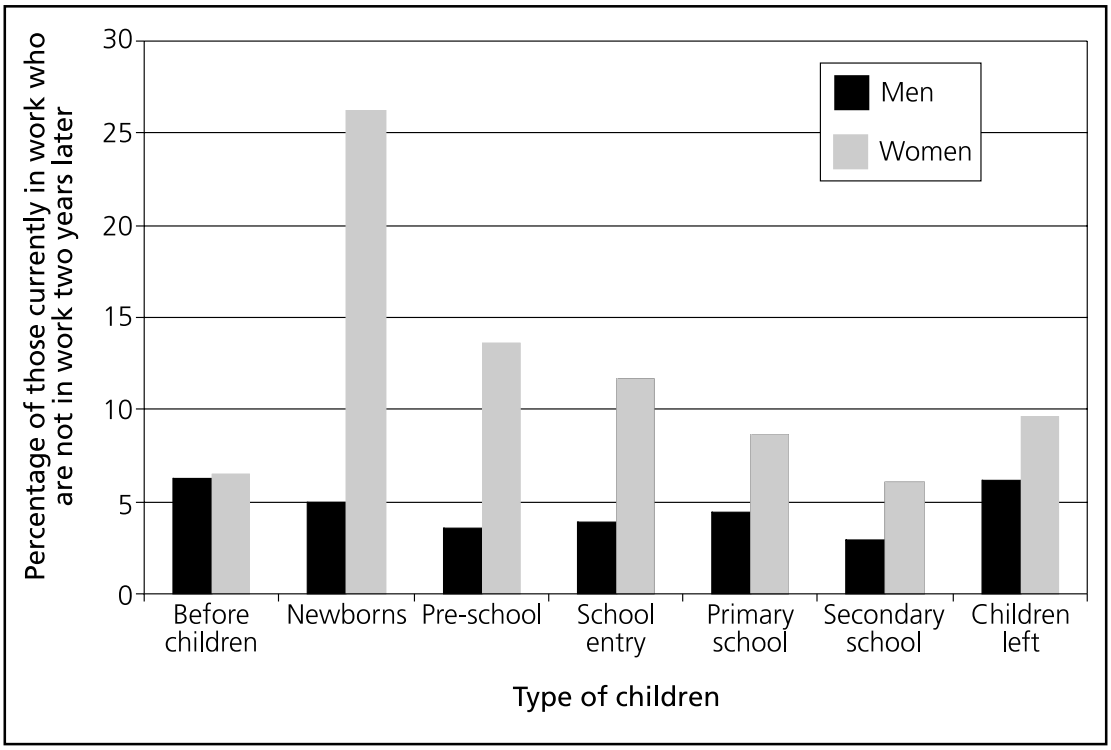


Figure 5.14 shows that newborns mark a sudden drop in the propensity to move into employment for women, but the proportion moving into it around the time of school entry is consistent with the gradual rise from pre-school to primary-school children. In comparison with men at the same stage of their lives, mothers with newborns and those with pre-school children are particularly unlikely to be moving into work.

Figure 5.15 Percentage moving out of work over two years



In a similar fashion, Figure 5.15, for movements out of work, shows that there is an unusually high degree of movement for mothers with newborns compared with women at other times, while the movement around school entry fits with the more general pattern of the lifetime profile for women. As the propensity for men to leave employment shows little variation across the groups, newborns stand out as a particularly unusual time for women relative to men.

Table 5.9 presents the results from probability models testing whether the differences observed across groups in Figures 5.14 and 5.15 are statistically significant – that is, whether they are likely to be representative of the entire population. Not surprisingly, women are most likely to move into work over the period of school entry and while all their children are at primary school. Rather than being a distinct critical point, this suggests that school entry marks the beginning of a longer period of movement back into work for mothers. Mothers with newborns are significantly less likely to move into work than women before or with no children, but are significantly more likely to move into work than those in the category where all the children have left the household or have reached age 17. The latter is not surprising as this group of older women may be substantially less mobile, due to cohort effects as well as to a simple age effect. Women are significantly less likely to move into work than men over the period of birth and while they have pre-school children (and once all the children have left home or reached age 17). Hence, it appears that birth, like school entry, is not a critical time for not moving into work but, rather, marks the beginning of a period when women are especially unlikely to move into work.

Table 5.9 Logit models for moving between work and non-work over two years

	Probability of working two years later if currently not working		Probability of not working two years later if currently working	
	coeff.	std. error	coeff.	std. error
Groups (comparing women):				
(1) Before or no children	1.117***	0.099	–1.635***	0.088
(2) With newborn child	omitted	omitted	omitted	omitted
(3) With pre-school child	0.149	0.117	–0.818***	0.119
(4) With school-entry child	0.343***	0.107	–0.990***	0.124
(5) With primary-school child	0.333***	0.109	–1.325***	0.106
(6) With secondary-school child	0.099	0.117	–1.722***	0.109
(7) Children left	–0.392***	0.110	–1.205***	0.092
Interacting group with men:				
(1) Before or no children×men	1.033***	0.096	–1.663***	0.087
(2) With newborn child×men	0.633***	0.190	–1.900***	0.146
(3) With pre-school child×men	1.042***	0.217	–2.251***	0.187
(4) With school-entry child×men	0.415**	0.185	–2.170***	0.166
(5) With primary-school child×men	0.425***	0.166	–2.044***	0.138
(6) With secondary-school child×men	0.310**	0.162	–2.486***	0.153
(7) Children left×men	0.133	0.127	–1.690***	0.103
Constant	–1.062***	0.081	–1.035	0.073
Significant differences:				
With newborns for women	groups 1, 4, 5, 7		all groups	
With school entry for women	groups 1, 2, 3, 6, 7		all groups except 3	
Between men and women	groups 2, 3, 7		all groups except 1	
Log likelihood	–5,784.2		–9,066.1	
Number of observations	9,329		36,350	

Notes: Coefficients are significantly different from zero at the one per cent level (***), five per cent level (**) and ten per cent level (*). The abbreviation coeff. denotes coefficient and the abbreviation std. error denotes standard error.

The picture for the probability of moving out of work over the two-year period is very clear-cut: women with newborns are significantly more likely to move out of work than any other group of women or any other group of men, including men at the same critical time. Women with children entering school are also significantly more likely to move out of work than all other groups of women except mothers with pre-school children and than men at the same time. Hence, while newborns are clearly a critical time for women leaving employment, school entry is part of a longer period of unusually high exit from work which covers the time between birth and all children being in school.

5.7 Summary on work participation

Prior to the arrival of children, men and women are equally likely to be working: 81 per cent of men and 82 per cent of women are in formal paid work. Work participation rates for women drop below those for men only in the year immediately

prior to first birth, reflecting a decline in work during the months running up to the birth. In the year following the birth of the first-born, the work rate for women plummets to just over 40 per cent, while men continue to participate in work in the same way as before children. Women gradually return to work following the first birth, with the proportion in work jumping up to 55 per cent in the following year and then climbing steadily for 20 years. Over all the years with children present in the household, an average 64 per cent of mothers are in work, compared with some 89 per cent of fathers. Even once the children have grown up or left home, the gender gap in work participation persists, with only 74 per cent of women in formal paid work compared with 84 per cent of men.

While women will inevitably be absent from work for some time following childbirth, a crucial question is how long they remain absent and what factors influence this length of absence. Although roughly half of all mothers will return to work during the first year after a birth, only an additional quarter will return by the end of five years since birth. Indeed, even by eight years after birth, over ten per cent of mothers have never returned to formal paid work at any point. The speed of return is influenced by many factors, only some of which have been identified in previous work.

Mothers working prior to the birth have significantly shorter absences following birth than mothers who were not working. As most women are in work prior to their first birth, this difference is mostly capturing the impact of women remaining absent from work between births. There are two competing explanations for the relationship: First, women may vary in their attachment to work and those remaining in work between births may simply have a higher propensity to be in work. Second, there is dynamic persistence in labour market behaviour, so the choices that women make after the first birth directly affect the options open to them after subsequent births. On the one hand, the fact that mothers of subsequent births working prior to birth return significantly more quickly than mothers of first-borns working prior to birth suggests that the former are a select sample with a greater propensity to work than the first-borns group, supporting the first explanation. On the other hand, the relationship between prior work and the length of absence is significant and sizeable in models that contain controls for a wide range of measured demographic and family characteristics and for unobserved differences in labour market attachment, which strengthens the case that there is genuine persistence in work participation. If there is a genuine persistence, then encouraging mothers to return to work after the first birth becomes more important as it could reduce the length of absence from work after the first and any subsequent births.

The size and timing of family formation are also defining features of how quickly mothers to return to work following birth. The speed of return decreases for subsequent children: the average length of absence following birth is 20 per cent longer for a second birth than for a first birth and 50 per cent longer in the case of third or subsequent children. However, these differences across birth order can be explained by variation in the mother's work prior to the birth: once allowance is made for the mother's employment prior to birth, mothers with a second birth

return more quickly to work than those with a first. Mothers with partners who go on to have another child spend more time out of work than those for whom family formation is complete, while those with longer gaps between children tend to return more quickly, suggesting that mothers find it more worthwhile to return to work more quickly if the interruptions of birth are further apart. Not surprisingly, births of twins or triplets are associated with longer absences. Women having children later in life return to work more quickly on average than younger mothers, although this is not an age effect per se and is explained by the fact that older mothers are more likely to be in work prior to the birth.

Some types of mothers return to work more slowly following birth: those with lower levels of education, non-white mothers and mothers without working partners. The impacts of education and the presence of a working partner are partly explained by related differences in whether the mother was working prior to birth and work characteristics including the wage. However, the impact of ethnicity remains, even allowing for differences across these factors, suggesting that the reason for it must lie in other factors such as differences in family or social support, differences in attachment to the labour force or ethnic discrimination in the labour market and that it may require special policy attention. For mothers with partners, the length of absence is positively related to the partner's earnings, suggesting that mothers with higher-earning partners may be able to afford to spend more time away from work. This may have implications for policies that raise household income following a birth, such as maternity pay, benefits or tax credits, although the estimated effect is not large

Type of work is also related to the length of absence for those working prior to the birth. Those previously working longer hours or earning lower hourly wages have shorter absences, although both effects are relatively small. Industry and occupation are also important factors. Mothers who previously worked in the public sector have significantly shorter absences from work following birth than those who worked in the private sector: on average, women who were working in the public sector prior to birth have absences that are 75 per cent the length of those previously working in the private sector. If shorter absences are deemed desirable, it would be interesting to investigate what particular traits of public sector employment entice mothers to return to work sooner and could be encouraged in the private sector where not already present.

From a policy perspective, one of the most important issues for the length of absence following birth is maternity leave and maternity pay rights. The evidence presented in this report confirms previous findings that mothers have a tendency to return to work either when the period of paid leave ends or when the period of unpaid leave ends if it is longer and the mother can afford to continue beyond the paid period. However, the analysis here has highlighted two new important considerations: first, that maternity pay may allow women to be able to afford to extend their absence even beyond the termination of the period of maternity pay; and second, that maternity leave may encourage some women to shorten their absence in order to be eligible for the associated rights. Overall, these may be encouraging findings:

maternity leave and pay entitlements may be enabling some mothers to take the longer maternity leave they desire, while others find the maternity leave rights sufficiently beneficial to return to work earlier in order to benefit from them. Moreover, the analysis has highlighted how both the duration and **generosity** of maternity pay will determine its impact on the length of mothers' absence by determining how long mothers can afford to remain away from work, while the length of maternity leave and the termination of its associated rights may constrain some women to return earlier than they would otherwise have done. In terms of the development of future policy, the evidence does not show whether maternity leave or maternity pay is the more influential, but in reality it is how the two combine that determines the influence of each.

Although mothers may return to formal paid work quickly after birth, this might be only a temporary situation because of natural fluctuations in employment; because of the interruption of a subsequent birth; because of the discovery that mixing work and motherhood is not as expected; or because home circumstances alter as the child ages. Ten years after birth, 51 per cent of mothers have had a subsequent birth, 17 per cent have permanently returned to work, 27 per cent have temporarily returned and five per cent have not returned at all. Even in the absence of a subsequent birth, mothers are substantially less likely to remain permanently in work than would be expected from normal labour market dynamics: while 38 per cent of mothers who have returned to work within ten years and have not had a subsequent birth have remained permanently in work, some 61 per cent of men in the same position have remained permanently in work. Hence, policy initiatives aiming to enhance the work participation of mothers need to focus not just on encouraging them to return to work following the birth, but also on ensuring that they remain in work after they have finished having children. In addition, subsequent births are more likely than first births to be followed by no return or a temporary return to work rather than a permanent return, possibly reflecting that it is easier to remain in work with a single child than with more than one child. The likelihood that a return to work is permanent is greater for mothers with partners than for lone mothers.

Most importantly, the analysis in this report could not find any strong evidence that longer absences from work following birth reduce the probability of a mother working in the future, as has been found in studies of women in the 1980s and 1990s.

A second potentially critical time in women's employment is when a child starts compulsory schooling at age four or five. This may affect the mother's employment choices by effectively providing free and compulsory alternative childcare to the mother for a considerable portion of the day or by introducing new demands from school life for the mother. Some 53 per cent of mothers are reported as being in work in the June prior to school entry, compared with 57 per cent in the September post-school entry. For mothers with their last child entering school, the proportion in work rises from 60 per cent to 67 per cent over the school entry. Given the argument of some recent policy debate that mothers should be able to undertake formal paid

work once their youngest child starts school, this increase in work participation of seven percentage points over the period of school entry may seem surprisingly small.

This change in aggregate work participation at the time of school entry masks a high degree of churning: mothers are not only entering work at this point, but also leaving it. The proportion of mothers who switch between working and not working over school entry is high regardless of the child order: 19.5 per cent for those with their first child, 17.5 per cent for those with a middle child and 16.7 per cent for those with their last child entering school. Hence, while school entry may appear to be a critical period only for mothers with their last child starting school according to the aggregate statistics, examination of the underlying transitions suggests that it may be a critical period in both directions for a substantial proportion of mothers.

Movements into and out of work around the time of school entry are related to several factors. Mothers more likely to move into work include those with their last child entering school, those with a larger gap between the school-entry child and younger children, mothers with higher levels of education, white mothers, mothers without a health problem and those with a working partner. Mothers with higher-earning partners are less likely to return to work, suggesting, similarly to earlier, that subsidising the income of families through maternity pay, benefits or tax credits could reduce the propensities of mothers to work. The propensity to remain in work for those working prior to school entry is related to a similar, but smaller, set of factors. Mothers more likely to remain in employment include those with their last child entering school, those with a smaller gap between the child entering school and older siblings, white and black (as opposed to other race) mothers and mothers without a health problem. Whether the mother was working part-time or full-time prior to school entry is not significantly related to the likelihood of remaining in work.

Returning to the lifetime perspective of work patterns, the evidence suggests that both newborns and new schools are critical times. Women with newborns are significantly more likely to move out of work than any other group of women or any group of men. In addition, the arrival of a new child marks a sudden drop in the propensity to move into work for women, although women are significantly less likely to move into work than men both over the period of birth and throughout the pre-school years. School entry also marks a turning point in work behaviour for women, although more in terms of an acceleration of movement rather than a change in direction. The likelihood of moving out of work is not significantly different for mothers around the time of school entry and for mothers with pre-school children, but it is significantly higher than for those with only school children. On the other hand, the probability of moving into work is significantly higher than for mothers of pre-school children and no different from those with only school children. Hence, school entry marks both the last years of unusually high exit from work for women and the first years of unusually high entry into work which, combined, leads to a time of unusually high change in women's work participation.

6 Children and the gender wage gap

This chapter considers the impact of children on women's wages. Section 6.1 uses the cross-section comparative sample to describe differences in the gender wage gap between the broad groups of those with and those without children and analyses how much of the gender wage gap can be attributed to differences in observable characteristics in each case. Section 6.2 compares wage growth for women at the critical points of birth and school entry with changes at other times for women and changes at the same stages for men using the comparative panel data-set. Sections 6.3 and 6.4 use the newborns and new schools samples of women respectively to consider which demographic factors are related to wage growth for women at these critical times. Section 6.3 also considers whether maternity rights have any impact on wage growth in the case of newborns. Section 6.5 summarises the findings on the gender wage gap.

6.1 Cross-section analysis

The previously established fact that gender differences in the hourly wage tend to be associated with motherhood (also termed the 'family gap' in wages) is confirmed in Table 6.1.

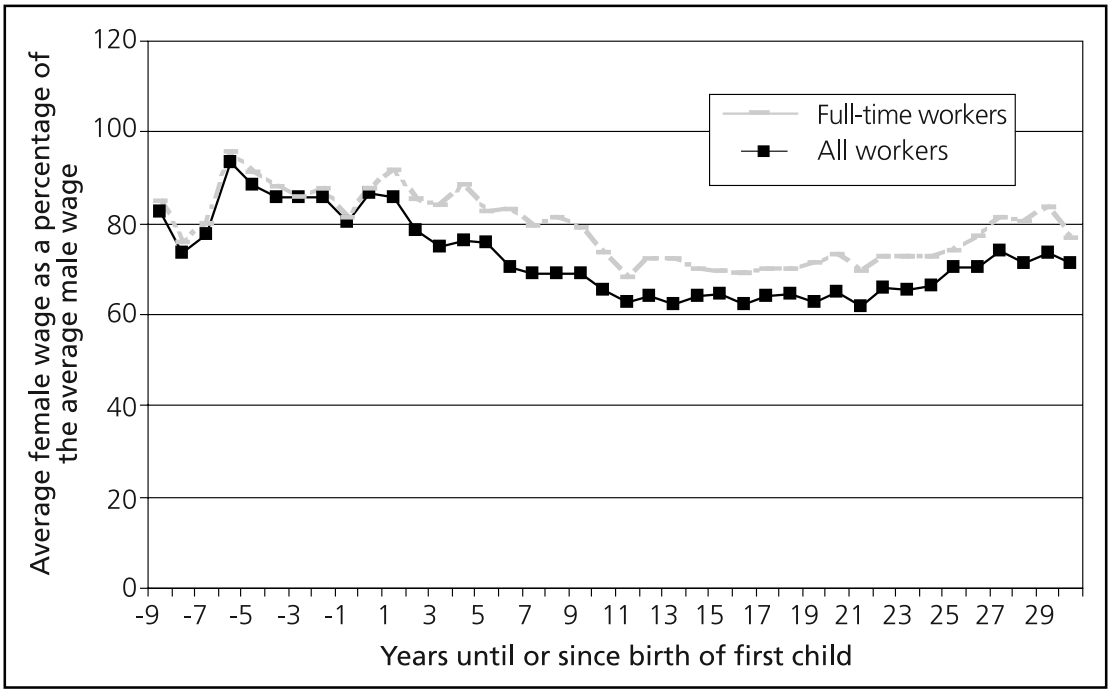
Table 6.1 Wage rates across broad groups

	Average hourly gross wage				Gender wage gap: average female wage as percentage of average male wage	
	Women		Men			
	All workers	Full-time workers	All workers	Full-time workers	All workers	Full-time workers
Before or no children	£7.62	£7.88	£8.35	£8.41	91.3	93.7
With children	£7.19	£7.96	£10.78	£10.77	66.6	73.9
Children left	£7.04	£7.70	£9.85	£9.79	71.5	78.6

The average female wage is 91 per cent of the average for men prior to children, but falls to 67 per cent for women and men with children and only slightly recovers to 72 per cent for women and men whose children have grown up or left home. Only a small fraction of this gap can be attributed to women working part-time: for full-time workers, the gender wage ratio is 94 per cent for those before children, 74 per cent for those with children and 79 per cent for the group after children.[52]

Figure 6.1 provides more detail behind these broad statistics by plotting the gender wage ratio by years until or since the birth of the first child. Women command lower wages than men even in the decade prior to the arrival of children.[53] The birth of the first child marks the start of a gradual decline in the position of women relative to men which lasts for approximately ten years; women's relative wage then stagnates for another ten years before showing a small recovery. The grey dashed line in the graph shows a similar pattern for those working full-time. This full-time gap is smaller than that for all workers following the arrival of children, possibly because substantial proportions of women are in part-time employment at this time, with those commanding higher wages more likely to be in full-time work.

Figure 6.1 Gender wage gap by years until or since birth of first child



[52] Table 6.1 shows that average wages are lower for the 'children left' group than for the 'children' group for both men and women. As the data are derived from panels covering relatively short periods, this can probably be attributed to a cohort effect, with generations born earlier commanding lower wages than their more recent counterparts.

[53] The lower gender wage ratio for the years before six years prior to birth has no obvious explanation other than that sample sizes for these points are quite small and the figures may not be very representative of the entire population.

In order to assess how much of the gender wage gap can be explained by differences in observable characteristics between men and women, Table 6.2 presents the coefficient on the female indicator in a series of log wage regressions for the three broad groups. As the dependent variable is the natural logarithm of the wage, the negative coefficients on the female indicator approximate the percentage gap between average male and female wages.

Table 6.2 Log wage regressions by broad group

Coefficient on female dummy variable (standard error)	Regression sample		
Additional regressors	**Before or no children**	**With children**	**Children left**
None	–0.080*** (0.007)	–0.418*** (0.007)	–0.339*** (0.010)
Family background: number of children, age of youngest child, age, education, ethnicity, health problem, partner, whether partner working, partner's work hours, partner's earnings	–0.099*** (0.007)	–0.364*** (0.009)	–0.327*** (0.011)
Family background: as above Work characteristics: weekly hours, permanency, self-employed, supervisory position, sector, firm size, place of work, commuting time, time of day worked	–0.123*** (0.008)	–0.300*** (0.011)	–0.278*** (0.014)
Family background: as above Work characteristics: as above Occupation and industry	–0.118*** (0.008)	–0.281*** (0.011)	–0.249*** (0.014)
Family background: as above Work characteristics: as above Occupation and industry: as above Employment experience and employer tenure (quadratic)	–0.111*** (0.010)	–0.295*** (0.013)	–0 .226*** (0.017)

Notes: Coefficients are significantly different from zero at the one per cent level (***), five per cent level (**) and ten per cent level (*). Wage regressions using only full-time workers generated smaller coefficients on the female dummy variable but followed the same patterns.

For those before or with no children, the initial gender wage gap of approximately eight per cent is not explained at all by differences in observable variables: indeed, controlling for family background, demographics and work variables only widens the gap, suggesting that women should be earning more relative to men, given their characteristics.[54] In contrast, for those with children, differences in demographic

[54] Many of the work variables included in the regression are not strictly exogenous to the wage, because people choose jobs based not just on their wage, but also on other characteristics of the workplace. However, the technique used here:

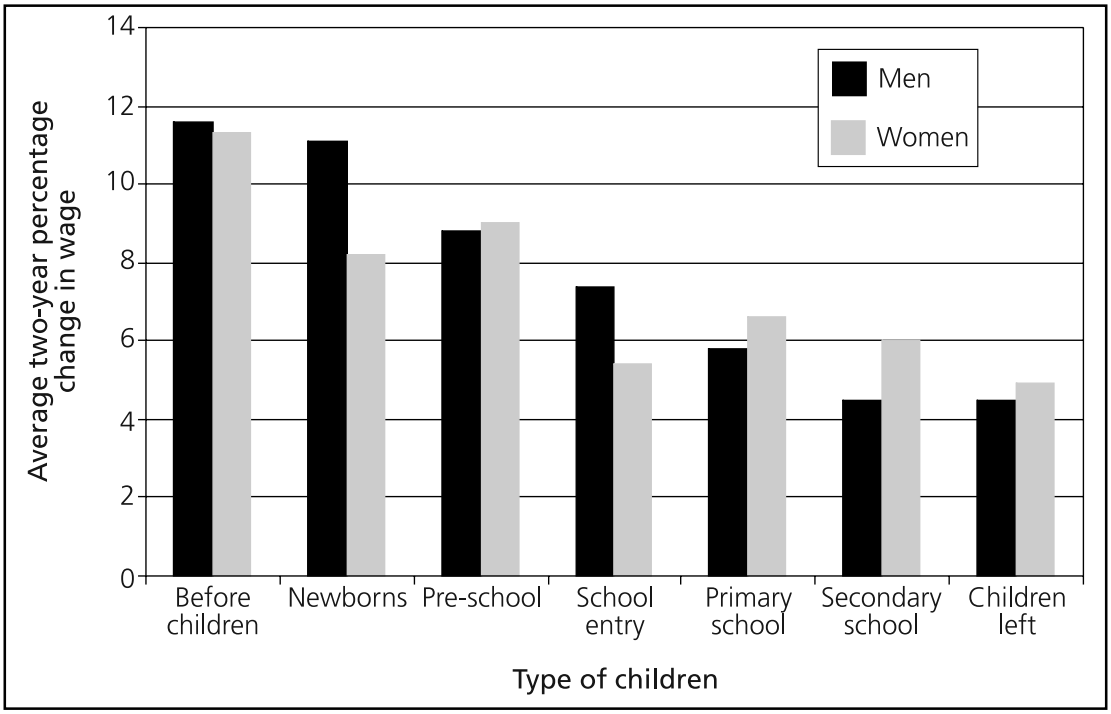
- to see how the gender wage gap is reduced when other controls are added;
- is common in studies of wage gaps, whether due to gender, ethnicity or part-time/full-time work.

and work characteristics explain almost 30 per cent of the gap,[55] while about one-third of the gap is explained for the 'children left' group.[56] While there is an unexplained gender wage gap of 11 per cent for male and female workers prior to children, the unexplained gaps of 30 per cent for those with children and 23 per cent for those whose children have grown up or left home are considerably larger. This shows that children affect women's wages in ways that are not solely driven by changes in other observed work characteristics and that the effects persist even once the children are no longer present in the household.

6.2 Are newborns and new schools critical points for wage growth?

This section examines whether the times of childbirth and school entry are critical times in the development of the gender wage gap. Figure 6.2 presents the average growth in wages across two interviews for the key seven groups.

Figure 6.2 Average two-year percentage change in wage



[55] The coefficient on the female indicator is smaller by 0.123 in the final row compared with the first, explaining 0.123/0.418 = 29.4 per cent of the raw difference.

[56] Corresponding wage regressions for full-time workers show very similar patterns, with lower gender wage gaps throughout.

The graph shows a very clear pattern: the bars for women are markedly shorter at the time of newborns and school entry than they would be if they were in line with the general pattern for women. Indeed, noting that average growth for women before children is 11 per cent and for women with pre-school children is nine per cent, suggests that growth for those with newborns would be more in line with the pattern if it were at ten per cent rather than eight per cent. Similarly, for mothers with children entering school, growth in the range of seven to eight per cent would be more appropriate than the actual growth, which is approaching five per cent. In comparison with men, the differences are even more marked: while wage growth for women is roughly equal to or greater than that for men for every other group, it is substantially lower for women than for men around birth and school entry.

Figure 6.3 Average two-year percentage change in wage for full-time workers

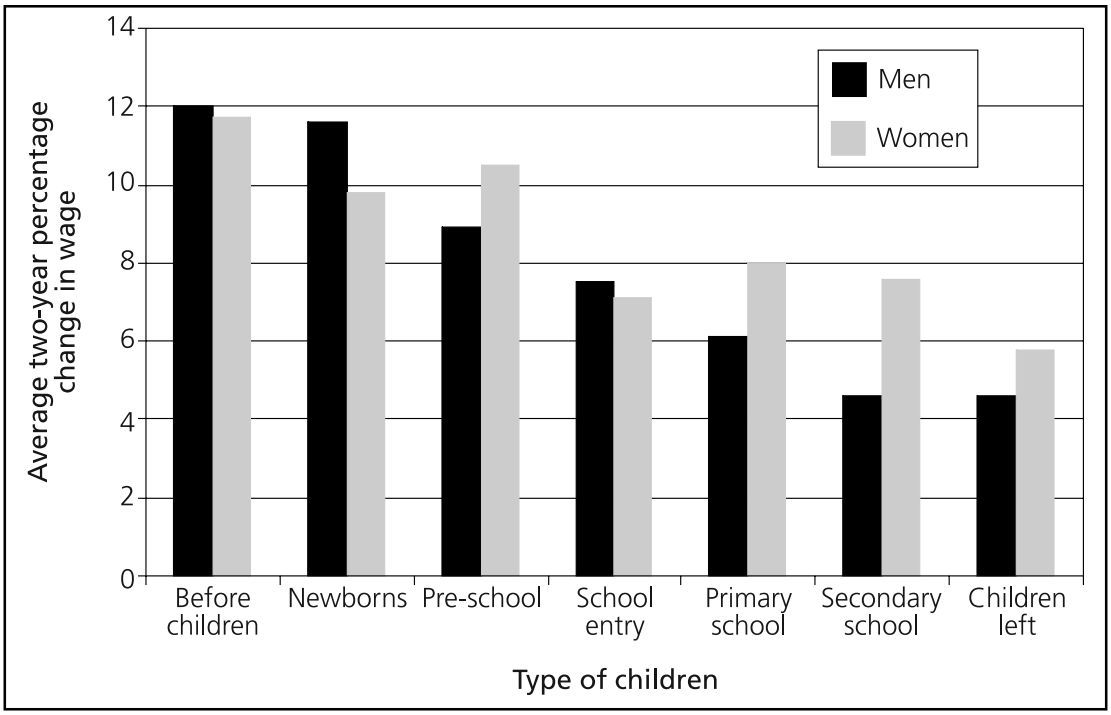


Figure 6.3 presents the same picture for the wages of workers in full-time work. The differences across the groups of women are smaller than those for all workers, although there is still a distinct drop for women at the point of newborns and school entry. While full-time working women with children generally have considerably higher wage growth than their male counterparts, the rate of growth is lower than that for men over the critical points.

Table 6.3 Wage growth regressions

Dependent variable: percentage change in wage over two years	Coefficient (standard error) Specification 1	Specification 2	Specification 3	Specification 4
Groups (comparing women):				
Before or no children	3.061**	2.137	0.510	–0.502
	(1.234)	(1.380)	(1.405)	(1.797)
With newborn child	omitted	omitted	omitted	omitted
With pre-school child	0.794	2.211	5.160***	3.258
	(1.663)	(1.817)	(1.839)	(2.445)
With school entry child	–2.892*	–2.372	1.279	–0.919
	(1.678)	(1.820)	(1.869)	(2.412)
With primary school child	–1.649	2.305	5.774***	2.918
	(1.412)	(1.564)	(1.598)	(2.002)
With secondary school child	–2.221	3.852**	5.900***	4.801**
	(1.357)	(1.532)	(1.562)	(1.953)
After children	–3.328***	3.189**	2.677*	1.824
	(1.285)	(1.524)	(1.552)	(1.956)
Interacting group with men:				
Before or no children×men	0.273	–0.181	–1.163*	–1.086
	(0.501)	(0.576)	(0.613)	(0.742)
With newborn child×men	2.889*	3.293**	0.576	–0.125
	(1.508)	(1.644)	(1.699)	(2.186)
With pre-school child×men	–0.196	0.189	–6.323***	–7.624***
	(1.623)	(1.737)	(1.811)	(2.354)
With school entry child×men	2.021	4.013**	–2.181	–0.243
	(1.575)	(1.690)	(1.803)	(2.258)
With primary school child×men	–0.834	–1.341	–8.713***	–6.182***
	(1.157)	(1.264)	(1.362)	(1.597)
With secondary school child×men	–1.561	–2.677**	–7.971***	–7.083***
	(1.054)	(1.146)	(1.232)	(1.432)
Children left×men	–0.371	–2.089**	–5.337***	–5.296***
	(0.764)	(0.827)	(0.910)	(1.148)
Family background: age, education, ethnicity, partner, whether partner working, partner's earnings, partner's work hours	not included	included	included	included
Work characteristics: weekly hours, permanency, self-employed, supervisory position, sector, firm size, place of work, commuting time, occupation, industry	not included	not included	included	included
Employment experience and employer tenure	not included	not included	not included	included

Continued

Table 6.3 Continued

Dependent variable: percentage change in wage over two years	Coefficient (standard error) Specification 1	Specification 2	Specification 3	Specification 4
Adjusted R^2	0.012	0.020	0.058	0.071
Number of observations	23,748	18,505	16,604	11,897

Notes: Coefficients are significantly different from zero at the one per cent level (***), five per cent level (**) and ten per cent level (*). The coefficients for the school-entry group are significantly different from those for before children and pre-school children for specification 1; for all groups of women for specification 2; and for pre-school, primary-school and secondary-school children in specifications 3 and 4. Estimating the models using only wages for full-time workers resulted in significant differences in wage growth between mothers with newborns and the children-left group in specifications 1, 2 and 3 and mothers of secondary-school children in specifications 3 and 4. For mothers with school-entry children, there were significant differences with before or no children in specification 1; with primary-school children in specification 3; with secondary-school children in specifications 2, 3 and 4; and with the children-left group in specifications 2 and 3. In the models using only full-time workers, there were no significant differences between men and women for the newborn and school-entry groups.

The significance of the differences in wage growth between groups is tested using wage growth regressions for the two-year changes. The results are presented in Table 6.3. Four different specifications are estimated, examining whether the differences can be explained by differences in observed demographic and work characteristics.

The wage growth for mothers with newborn children is not consistently significantly lower than that for other groups of women across the four specifications. On the other hand, it is significantly lower than that for men at the same time unless controls for work characteristics are included. This suggests that at least some of the differences in wage growth between men and women during this period may be due to differences in work characteristics. Comparing mothers at the time of school entry with other groups of mothers creates a more consistent picture than that for newborns: wage growth for women is consistently lower around the time of school entry than at other times. However, the difference with men at the time of school entry is only significant in specification 2. Hence, although Figure 6.2 appears to support the hypothesis that childbirth and school entry are critical times in the development of the gender wage gap, the statistical significance of the differences is not proven, especially when allowance is made for differences in other work characteristics.

6.3 Wage growth for women with newborns

The pattern in Figure 6.1 suggests that the impact of children on women's relative wages may not manifest itself as a sudden single impact at the critical points, but may gradually appear as a delayed reaction to the changes from those times. It is desirable, therefore, to consider the wage impacts beyond the two-year horizon. In addition, it is useful to analyse whether particular types of mothers are more likely

than others to experience unusual wage growth and to consider whether the length of maternity absence and the use of maternity entitlements influence the path of future wage growth. These elements are captured in the wage growth regression for the newborns sample results presented in Table 6.4.[57]

Before the results are discussed, it should be noted that the average wage growth is for mothers who were in work prior to birth and who have returned to work by the time of the interview in question. Hence, the regression for each interview is a select group of those who have returned to work prior to that interview. This means that changes across interviews reflect not only changes in the effects as time goes by but also the changing sample towards women taking longer absences from work following birth. This is particularly relevant for the variable measuring the length of absence following birth, which is always conditional on having returned to work by the interview. It may also explain why the average growth in wages does not uniformly rise across interviews.

Table 6.4 Wage growth regressions for women with newborns

Dependent variable: percentage change in wage since interview prior to birth	Interview following birth					
	First	Second	Third	Fourth	Fifth	Sixth
Mother with partner	–7.9	–15.3**	–8.8	–11.2	0.4	–21.0**
First newborn	–9.1*	–9.4**	–6.1	5.9	5.2	1.2
Multiple newborns	–22.7	–3.6	–14.3	–5.1	–8.6	–14.8
Gap with older sibling in months	–0.1	–0.0	–0.1	0.1	0.2**	0.0
Younger sibling	9.7**	9.8***	5.3	–0.1	1.2	3.0
Mother's age	0.5	–0.4	–0.1	0.3	0.2	0.0
Mother's education:						
1. No qualifications	omitted	omitted	omitted	omitted	omitted	omitted
2. NVQ 1/<GCSE	6.1	–4.2	–18.7*	0.6	16.6	–6.5
3. NVQ 2/GCSE	3.9	–4.5	–27.1***	–0.9	2.7	–3.8
4. NVQ 3/A level	7.5	–6.5	–30.5***	–2.8	–13.8	–1.5
5. NVQ 4–5/higher	5.9	0.0	–24.8***	9.1	5.8	3.4
Mother's ethnicity:						
White	omitted	omitted	omitted	omitted	omitted	omitted
Black	–11.1	32.6	26.9	37.5*	18.5	20.7
Other non-white	12.5	–8.7	0.2	9.4	16.1	8.8
Health problem	1.0	1.4	8.0	3.5	11.5	6.0

Continued

[57] Direct comparisons with groups at other times and with men at the same point in time cannot be made in a meaningful way once the period extends beyond two years because the groups begin to merge as additional interviews are added. For example, by six interviews beyond birth, the wage growth contains the effects of birth, pre-school children, school entry and primary-school children.

Table 6.4 Continued

Dependent variable: percentage change in wage since interview prior to birth	Interview following birth					
	First	Second	Third	Fourth	Fifth	Sixth
Prior work part-time	–6.4	–8.2**	–8.3**	–1.7	–8.3	2.7
Length of absence following birth in months	–3.1**	–0.3	–0.2	–0.4	–0.5	–0.7***
Returned with AML	0.8	0.5	5.3	1.6	–12.0*	–5.2
Returned with OML	–2.1	–1.9	7.2	5.6	–4.4	–8.3
Returned with SMP	–9.1	–1.5	–9.3**	–1.6	8.2	2.2
Returned with MA	–10.4	–5.2	–5.1	–1.0	– 0.7	6.8
Number of observations	269	456	391	341	288	247
Average wage change	4.4	8.2	7.2	8.3	9.0	11.9

Notes: Coefficients are significantly different from zero at the one per cent level (***), five per cent level (**) and ten per cent level (*). Sibling refers to a sibling of the newborn and not a sibling of the mother. Returned with Additional Maternity Leave (AML)/Ordinary Maternity Leave (OML) denotes those who were estimated to be eligible for maternity leave (AML or OML) and returned to work within the entitlement period or soon after its termination. Returned with Statutory Maternity Pay (SMP)/Maternity Allowance (MA) denotes those estimated to be eligible for maternity pay (SMP or MA). Omitting the maternity leave variables had no significant impact on the coefficients on the 'length of absence following birth' variable.

Mothers with partners experience significantly lower wage growth between the interview prior to birth and the second and sixth interviews than lone mothers. Those with first-borns experience substantially lower wage growth than those with subsequent births over the first two interviews post-birth, while those mothers who subsequently have a further child have substantially higher wage growth over these first two interviews. The lowest-educated mothers experience substantially higher wage growth around the time of the third interview following birth.[58] Prior part-time work is associated with lower wage growth around the time of the second and third interviews after birth. However, none of these effects is consistent across many interviews and the relationships do not all have obvious explanations. The lower growth for part-time work may reflect that wage growth is generally lower for part-time workers.

The length of absence following birth is generally associated with lower wage growth across all interviews, but the relationship is only statistically significant for the first and sixth interviews since birth. Returning having taken AML is associated with significantly lower wage growth at the fifth interview after birth, while being entitled to SMP during the absence is associated with significantly lower wage growth at the third interview. Where significant, these effects are of considerable size. Hence, there is some, very limited, evidence that longer absences from work

[58] This estimate is based on just 11 observations in the lowest education group at the third wave, which suggests that the estimate should be interpreted with caution, although it is statistically significant.

following birth may be detrimental to the wage levels commanded by women when they return to work, but there is no evidence that maternity rights are beneficial to future wage growth.

Previous work has found that those with longer absences suffer a greater wage penalty in the future than those with shorter absences (Joshi *et al.*, 1999; Waldfogel, 1998b) and that returning having taken maternity leave within the entitlement period has an even larger positive effect on future wages (Waldfogel, 1995, 1998b). The results presented here do not confirm these earlier conclusions, although this may be because our sample is too small to identify any effect with sufficient precision. There are at least two other ways of explaining the discrepancy: First, if the results reported here are true, it may reflect that there used to be a relationship but that it has changed over time. Second, the differences may be explained by the fact that the previous studies measured the length of return as simply whether or not the mother had returned within ten to 12 months of the birth, rather than the continuous measurement of the length of time between birth and returning to work used here.

6.4 Wage growth for women with children entering school

Table 6.5 provides the results from analogous regressions for women with a child entering school. As was the case with newborns, there are several factors that are significant only at one or two interviews with no obvious explanation for the relationships. The mother's age does have a large and statistically significant effect across most of the interviews: older women experience lower wage growth than other mothers following school entry. This may reflect a feature common across the labour market that wage growth declines with age. As was the case with newborns, more highly educated mothers have significantly lower wage growth at several of the interviews, while working part-time prior to school entry is associated with much lower wage growth than working full-time at most subsequent interviews.

Table 6.5 Wage growth regressions for women with children entering school

Dependent variable: percentage change in wage since interview prior to school entry	Interview following school entry					
	First	Second	Third	Fourth	Fifth	Sixth
Mother with partner	–1.0	4.4	1.1	2.0	7.5	6.7
First school entry	2.0	–0.9	–6.0	1.7	–3.7	–4.4
Multiple entries	36.6**	3.6	7.2	– .9	29.2	9.7
Gap with older sibling in months	0.1*	–0.1	0.0	0.1	0.1	0.1*
Younger sibling	0.1	1.2	3.0	–3.7	–4.3	–0.2
Mother's age	–0.5*	–0.3	–0.8**	–0.7*	–1.0**	–1.1**

Continued

Table 6.5 Continued

Dependent variable: percentage change in wage since interview prior to school entry	Interview following birth					
	First	Second	Third	Fourth	Fifth	Sixth
Mother's education:						
1. No qualifications	omitted	omitted	omitted	omitted	omitted	omitted
2. NVQ 1/<GCSE	4.5	–13.5**	–10.7	–4.4	–9.5	–5.6
3. NVQ 2/GCSE	0.2	–11.6**	–7.0	–3.7	–5.0	–10.6
4. NVQ 3/A level	–4.1	–15.9***	–10.7	–15.3**	–13.3*	–20.8**
5. NVQ 4–5/higher	–4.1	–14.4***	–7.6	–4.0	–6.5	–10.4
Mother's ethnicity:						
White	omitted	omitted	omitted	omitted	omitted	omitted
Black	–12.3	6.7	1.4	–10.0	21.2	29.1
Other non-white	14.9**	6.7	3.3	1.2	–0.3	8.7
Health problem	1.3	12.0**	5.8	8.4	6.9	10.5
Prior work part-time	–6.5**	–3.1	–8.1***	0.0	–7.4**	–7.6*
Number of observations	527	523	460	395	339	300
Average wage change	3.7	6.4	8.4	10.7	12.6	15.0

Notes: Coefficients are significantly different from zero at the one per cent level (***), five per cent level (**) and ten per cent level (*). Sibling refers to a sibling of the child entering school and not a sibling of the mother.

6.5 Summary on the gender wage gap

The previously established fact that gender differences in the hourly wage tend to be associated with motherhood (also termed the 'family gap' in wages) is confirmed in the analysis presented here. The average female wage is 91 per cent of the average for men prior to children, but falls to 67 per cent for women and men with children and only recovers slightly to 72 per cent for women and men with children who have grown up or left home. One possible explanation for the gender wage gap is that it reflects gender differences in demographic background, educational attainment and work characteristics and conditions. Using regression techniques to control for differences in these factors shows that there remains a substantial 'unexplained' gender wage gap of 11 per cent for those before children, 30 per cent for those with children present and 23 per cent for those whose children have grown up or left home. Hence, children affect women's wages in ways that are not solely driven by changes in other observed work characteristics. Moreover, the presence of a gap prior to having children suggests that either there are anticipatory effects of children or that part, but not all, of the gender discrepancy may be due to factors not related to children. The fact that there is a large gap even after children have left the household indicates that the effects of children on relative wages persist beyond their actual presence.

The lifetime profile of the gender wage gap does not mark childbirth and school entry as obviously critical points. Women command lower wages than men in the

decade prior to the arrival of children, but the birth of the first child marks the start of a gradual decline in the position of women relative to men which lasts for approximately ten years. Women's relative wages then stagnate for another ten years before showing the start of a small recovery approximately 20 years after the first birth.

However, examining wage growth for specific two-year slots shows a very clear pattern: wage growth for women is markedly lower at the time of newborns and school entry than it would be if it were in line with the general pattern over family formation. Indeed, according to the trend, wage growth for women should be two to three percentage points higher over the critical periods. In comparison with men, the differences are even more marked: while wage growth for women is roughly equal to or greater than that for men for every other group, it is substantially lower for women than for men around birth and school entry. This is consistent with the lifetime profile: the gradual decline in women's relative wages following the birth of the first child could reflect the accumulation of several short periods of low growth around each birth and each school entry. However, there is a caveat to the conclusion that birth and school entry are critical times in the development of the gender wage gap in that the statistical significance of the differences is not proven, especially when allowance is made for differences in other work characteristics.

Previous studies have found that those with longer absences from work following birth suffer a greater wage penalty in the future than those with shorter absences, and that returning having taken maternity leave within the entitlement period has an even larger positive effect on future wages. The analysis presented here finds only very limited evidence that longer absences from work following birth may be detrimental to future wage levels for women, and there is no evidence that maternity rights are beneficial to future wage growth. However, this lack of significant conclusions may be due to the sample sizes being too small to identify the effects.

Indeed, only a few factors were identified as being related to lower wage growth in the six years following birth or school entry and, even then, the relationships were not consistent across the six years. There is limited evidence of lower wage growth following birth for mothers with partners, for mothers of first-borns, for those who do not subsequently have another child and for those in part-time work prior to birth. For those with a child entering school, wage growth is lower for older mothers and for mothers who were working part-time prior to school entry.

7 Children and other work characteristics

It is sometimes argued that mothers earn lower wages than their equivalent male counterparts because they have different preferences over other work characteristics, such as flexibility in hours or convenience of location, which they choose rather than higher wages. On the other hand, it could also be argued that lower relative wages for mothers reflect a generally weaker position in work, whereby lower productivity (or perceived productivity) manifests itself not only in a lower wage but also in other less desirable work features.

In order to investigate these claims, this chapter considers changes in other work characteristics at the critical times of birth and school entry. Section 7.1 presents a broad comparison between those with and those without children using the cross-section comparative sample. Section 7.2 considers the changes in these characteristics over the critical periods and draws comparisons with changes at other times for women and at the same stages for men using the comparative panel sample. Section 7.3 analyses the relationships between the changes and demographic factors for the newborns sample and considers the impact of entitlements to maternity pay and leave on the changes in these work characteristics. Section 7.4 performs a similar analysis for mothers with children entering school. The final section summarises the findings.

7.1 Cross-section analysis

Table 7.1 compares a range of work characteristics across the three broad groups defined by the presence of children. These characteristics can be divided into two groups: those indicating the segment of the labour market (sector, whether self-employed and, later in the analysis, occupation and industry[59]) and those indicating

[59] Industry and occupation are not presented in Table 7.1 due to the multitude of categories, but whether occupation or industry has changed is included in the subsequent analysis.

the nature of the work and working conditions (weekly hours, permanency of position, supervisory role, place of work and time of day worked).[60]

Employer tenure is very similar for men and women prior to children, but while men's average tenure is considerably higher for the group with children, the average tenure for women is little different between the group before children and those after children. This is not surprising, given that the absence from work for women following the arrival of children may terminate a particular employer/employee relationship. However, tenure rises at a similar rate for both genders once children have grown up or left home. Women are always less likely to work in the private sector than men and are more likely to be employed in the public sector, although the differences in sector are slightly greater for those with children and the group 'children left'. The gender differences in the percentage in self-employment are fairly consistent across the three groups: women are always less likely to be self-employed than men.

Table 7.1 Other work characteristics

Employment characteristic	Before or no children		With children		Children left	
	Men	Women	Men	Women	Men	Women
Mean employer tenure in months	47.9	46.7	84.4	47.8	110.7	96.2
Percentage in sector:						
Private	81.8	67.8	79.2	58.4	79.8	56.9
Public	14.4	27.4	17.9	36.1	17.6	36.9
Other	3.8	4.9	2.9	5.5	2.6	6.2
Percentage self-employed	11.2	5.0	17.0	7.6	19.3	9.0
Mean weekly hours	43.2	38.4	46.0	27.0	47.2	32.6
Percentage in full-time	92.9	86.9	97.0	43.4	97.6	63.7
Percentage in permanent position	88.9	89.2	95.1	91.2	95.1	94.4
Percentage in supervisory position	34.6	34.8	48.7	29.2	45.0	32.9
Percentage work at home	3.6	1.7	7.2	6.1	7.7	5.7
Percentage working at time of day:						
During day	71.3	73.5	68.4	57.7	68.4	62.1
am or pm	2.3	2.7	1.5	14.5	1.8	13.7
Some evenings/nights	5.0	4.2	4.1	10.7	3.4	4.9
Varies	14.9	12.6	17.5	9.8	16.8	12.3
Other	6.5	7.1	8.7	7.3	9.6	7.1

Mean weekly hours and the proportion working part-time present a different picture. Even before children, women work fewer hours and are less likely to be in

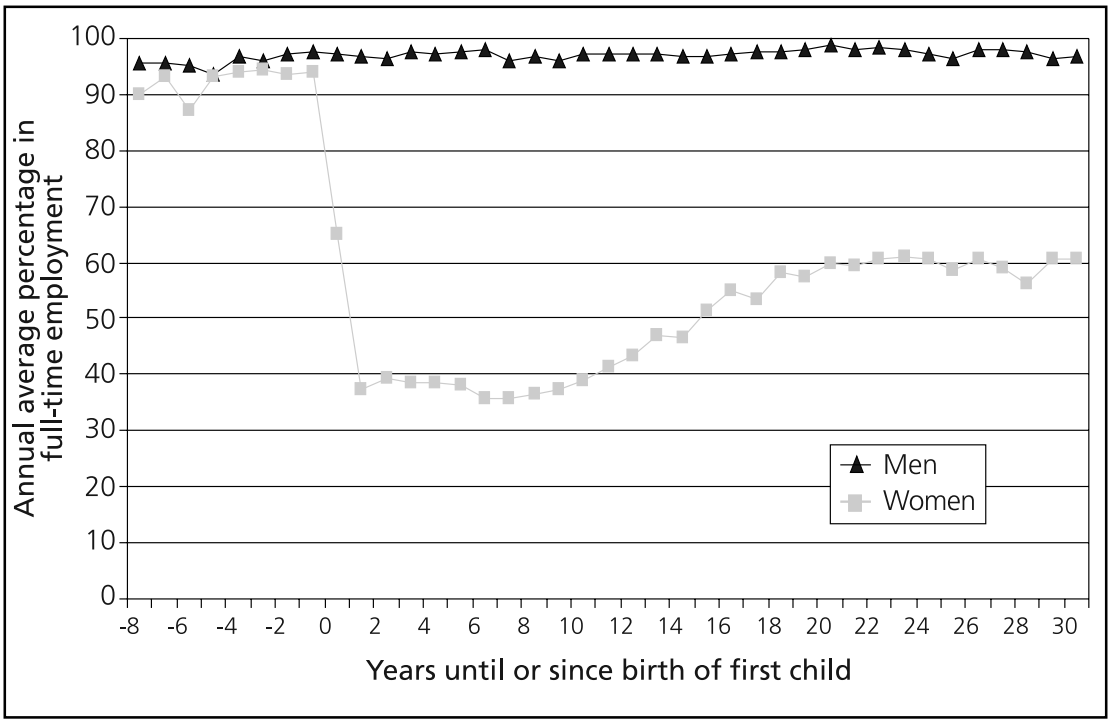
[60] Employment experience, firm size and commuting time were also considered but these factors did not exhibit any unusual differences across the broad groups or in changes around the time of birth or school entry.

full-time work. Yet there are substantial drops in hours and in the proportion working full-time for women with children which do not entirely recover in the group after children. The percentage in a permanent position is very similar for men and women prior to children, but men with children are slightly more likely to be found in a permanent position than women with children. This difference is not so marked once the children have grown up or left home. The likelihood of a supervisory role is equal for men and women prior to children, but there is a large gender gap for those with children which persists into the after-children group. Although men are slightly more likely to work at home than women, the gender gap is fairly constant across all groups. Finally, gender differences in the time of day worked are markedly different between the groups. While men and women have similar patterns prior to children, women with children are much more likely to be working 'mornings or afternoons' or 'working some evenings or nights' than men with children and are less likely to be working 'during the day' or at 'various times'.

Overall, the evidence shows that differences between mothers and fathers exist in a wide range of work characteristics which are not always present prior to the arrival of children. Hence, the 'family gap' in work extends beyond simple participation and the hourly wage.

One of the most dramatic differences in Table 7.1 is between the proportions of female workers in full-time work prior to children and with children. To investigate this difference further, Figure 7.1 presents the proportions of male and female workers working full-time by years prior to and since the birth of the first child.

Figure 7.1 Percentage of workers employed full-time by years until or since birth of first child



The pattern in this graph is closer to that for employment participation than to that for wages. There are no obvious anticipatory effects in the sense that female workers do not begin to shift towards shorter hours in the years immediately leading up to birth, although women have a very slightly lower propensity to work full-time than men even prior to the birth. Unlike the participation figure, the substantial drop in the proportion of women working full-time at the birth of the first child is followed by a long period of stagnation in the full-time employment rate: indeed, the rate does not even begin to rise until over ten years after the first birth. Even 30 years after the birth, only 60 per cent of female workers are in full-time employment compared with almost 100 per cent of men. It is interesting to note that while work participation rates for women do eventually, more or less, recover from the impact of birth and children (Figure 5.1), the gender wage gap does not return to pre-children levels within the same period (Figure 6.1) and the hours of work for women barely make any recovery at all.

7.2 Are newborns and new schools critical times for other work characteristics?

This section considers whether changes in employment characteristics are unusual for women around the time of birth and school entry by comparing the changes around newborns and new schools with those for women at other stages of their lives, and with those for men at the same stages of their lives. Tables 7.2, 7.3 and 7.4 present the results of this analysis.

Women are significantly more likely to change employer around the time of birth and school entry than at other times (Table 7.2). Women are also more likely to change employer than men at virtually every stage, although the differences between men and women are quantitatively greater at the two critical times. For newborns, this is not surprising as many women do not have maternity entitlements that could facilitate them returning to the same employer following a birth, and the period of absence from work following birth, regardless of entitlements, can be substantial. The greater propensity to change employer over school entry is more surprising and may reflect mothers making changes in their work characteristics by switching employer.

The propensity of men and women to change occupation or industry declines steadily with each stage of family formation, although there is a slight jump up for women with school entry.[61] Interestingly, men are generally more likely to change industry or occupation than women throughout the groups. Newborns and school entry do not appear to be critical times for movements between sectors, although it is interesting to note that women are consistently more likely than men to leave the

[61] The proportions changing industry or occupation may seem unusually high and may reflect measurement error as the categorisation of particular positions into occupation and industry has a tendency to vary across interviews in panel data.

private sector for a different sector of work, while men are more likely to leave the public sector. Switches between employment and self-employment are not significantly different across the critical times (Table 7.3), although there is a slight increase in the propensity to become self-employed for both men and women in the newborns group.

Hence, while newborns and new schools are critical times for women in terms of changing their employer, there is no evidence that they are critical times for changes in other work characteristics that define the segment of the labour market that they work in.

Table 7.2 Changes in other work characteristics over two years (I)

	Percentage who change employer		Percentage who change industry or occupation		Percentage leaving private sector		Sector Percentage leaving public sector		Percentage leaving other sector	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Groups:										
(1) Before or no children	45.5	44.9	50.1	44.1	3.8	7.4	17.0	10.0	36.8	41.6
(2) With newborn child	47.2	74.2	49.6	42.6	3.3	9.1	9.7	9.9	17.9	27.8
(3) With pre-school child	35.2	49.8	47.0	40.8	2.3	6.0	11.8	5.6	36.4	47.8
(4) With school-entry child	31.9	58.4	41.9	43.8	2.8	9.0	10.7	8.5	53.3	54.5
(5) With primary-school child	30.6	44.4	41.7	39.2	0.7	10.7	6.8	9.7	47.1	33.3
(6) With secondary-school child	27.7	33.3	41.7	36.7	3.0	8.7	7.9	7.4	37.5	31.9
(7) Children left	27.3	26.3	40.9	34.9	2.3	7.3	10.6	7.7	34.0	30.1
Significant differences:										
With newborns for women	all groups		groups 6, 7		none		none		group 4	
With new schools for women	all groups		groups 5, 6, 7		none		none		groups 2, 5, 6, 7	
Between men and women	groups 2, 3, 4, 5, 6		groups 1, 2, 3, 6, 7		all groups		groups 1, 3, 7		none	

Notes: The significance of the differences between groups was estimated using logit models for the discrete changes. Those who move between employment and self-employment are counted as having changed employer (self being counted as a different employer).

Table 7.3 Changes in other work characteristics over two years (II)

	Employment and self-employment				Weekly hours					
	Percentage of self-employed who become employed		Percentage of employed who become self-employed		Mean change in weekly hours		Percentage of part-time who become full-time		Percentage of full-time who become part-time	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Groups:										
(1) Before or no children	18.1	19.4	3.1	1.7	0.7	0.9	64.4	53.3	2.0	3.9
(2) With newborn child	17.6	27.8	4.1	4.0	-0.2	-7.1	60.0	9.2	1.8	49.5
(3) With pre-school child	19.6	29.7	3.6	2.6	0.0	1.4	70.8	18.0	1.2	12.7
(4) With school-entry child	11.0	29.9	3.6	2.3	-0.5	1.5	65.0	16.4	1.7	20.3
(5) With primary-school child	13.4	17.9	3.8	2.3	-0.1	1.9	73.7	19.4	1.1	13.6
(6) With secondary-school child	12.2	19.3	3.1	1.4	-0.1	1.8	69.8	24.4	1.1	10.3
(7) Children left	12.4	17.7	2.7	2.0	-0.2	0.0	59.2	14.9	1.2	8.0
Significant differences:										
With newborns for women	none		groups 1, 4, 5, 6, 7		all groups		all groups		all groups	
With new schools for women	groups 1, 5, 6, 7		group 2		groups 1, 2, 7		groups 1, 2, 6		all groups	
Between men and women	groups 4, 6, 7		groups 1, 5, 6		groups 2, 3, 4, 5, 6		all groups		all groups	

Notes: The significance of the differences between groups was estimated using logit models for the discrete changes and using regression models for the continuous variable weekly hours.

Table 7.4 Changes in other work characteristics over two years (III)

	Permanency				Supervisory role				Place of work				Time of day	
	Percentage of permanent who move to temporary		Percentage of temporary who move to permanent		Percentage of supervisory who move to non-supervisory		Percentage of non-supervisory who move to supervisory		Percentage of those working at home who move to elsewhere		Percentage of those working elsewhere who move to home		Percentage who change time of day worked	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Groups:														
(1) Before or no children	3.8	3.7	67.3	68.9	24.5	25.2	20.5	21.1	43.7	51.3	2.1	0.9	19.4	19.1
(2) With newborn child	2.7	6.9	75.4	50.0	17.6	36.7	23.9	14.8	39.6	15.8	2.9	4.0	17.5	10.2
(3) With pre-school child	2.0	2.4	64.4	72.3	19.8	27.5	17.5	16.9	46.2	37.8	2.7	2.3	13.1	9.2
(4) With school-entry child	2.5	6.7	65.9	70.6	15.2	29.7	18.8	13.4	33.9	44.4	3.4	2.2	14.2	12.0
(5) With primary-school child	2.0	3.6	59.3	69.3	17.8	23.2	18.5	14.2	30.1	27.9	3.5	2.0	12.0	13.8
(6) With secondary-school child	2.5	3.0	68.2	66.1	17.6	27.6	21.5	15.3	27.4	24.3	2.8	1.3	13.3	13.5
(7) Children left	2.4	2.3	71.2	60.7	19.2	23.0	15.4	12.6	31.5	28.9	2.9	2.1	18.3	15.5
Significant differences:														
With newborns for women	groups 1, 3, 5, 6, 7		groups 1, 3, 4, 5, 6		groups 1, 3, 5, 6, 7		group 1		groups 1, 3, 4		groups 1, 4, 5, 6, 7		groups 1, 5, 6, 7	
With new schools for women	groups 1, 3, 5, 6, 7		group 2		groups 5, 7		group 1		groups 2, 5, 6, 7		groups 1, 2		groups 1, 3, 7	
Between men and women	groups 2, 4, 5		groups 2–7		groups 2–7		groups 2, 4, 5, 6, 7		group 2		groups 1, 5, 6, 7		groups 2, 3, 7	

Notes: The significance of the differences between groups was estimated using logit models for the discrete changes.

The story is very different, though, for those characteristics that define the nature of their work and working conditions. There are dramatic changes in women's work hours with the arrival of a newborn: average weekly hours fall by 7.1 over the time of a birth for women, while they increase by between one and two during all other stages of family development. The decrease in hours is significantly greater for women with newborns than for men at the same critical time. Interestingly, school entry does not mark a time of unusual change in work hours for women: the increase of 1.5 hours over the two years is not significantly different from the changes for mothers with pre-school or school children. This increase is significantly different from the decrease in work hours that men experience over school entry, but this is consistent with the pattern for the pre-school children and school children groups. Correspondingly, women with newborns are significantly less likely to move from working part-time to full-time than other groups of women: only 9.2 per cent of those initially working part-time make the change over the two years compared with between 16 and 24 per cent for other groups of women with children. Mothers with children entering school are not significantly more likely to move from part-time to full-time work than mothers with pre-school or only primary-school children. However, both mothers of newborns and mothers with children entering school stand out as significantly more likely to move from full-time to part-time work than all other groups of women: some 49.5 per cent of mothers with newborns and 20.3 per cent of mothers with a child entering school initially working full-time are in part-time work two years later, compared with between ten and 13 per cent for the other groups of mothers.[62] Whether a movement towards shorter hours and part-time work is good or bad for women is not clear. On the one hand, it may reflect a desire on the part of women to work less to allow greater time for child responsibilities. On the other hand, part-time work often pays less well and is argued to have a lower status than full-time work.

Mothers with newborns and mothers with a child entering school are significantly more likely to move from a permanent to a non-permanent position than other groups of women and men at the same critical points (Table 7.4). Some 6.9 per cent of mothers with newborns and 6.7 per cent of mothers with children entering school initially working in a permanent position will move into non-permanent work, compared with 3.7 per cent or less for all other groups of women. Mothers with newborns are also significantly less likely to move from non-permanent to permanent work: only 50 per cent make the transition, compared with at least 60 per cent for all other groups of women and with 75 per cent for men with newborns. It is hard to argue that this general movement towards temporary work for mothers of newborns and children entering school is something that might be desired in itself by these mothers and it is more likely to reflect a loss of labour market position (possibly through having to change employer) or a compensating change for other more desirable work characteristics.

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[62] The fact that mothers with a school-entry child appear only as significantly different in the move from full-time to part-time suggests that small increases within part-time or full-time may have a sufficient offsetting effect to generate an overall net gain in weekly hours.

Mothers of newborns are particularly likely to move from a supervisory position to a non-supervisory position: some 37 per cent of those initially in a supervisory position make the transition, compared with between 23 and 30 per cent for all other groups of women and with 18 per cent of men at the same point in family development. However, there is no significant difference for mothers with children entering school or for either critical time in the propensity to move from a non-supervisory into a supervisory role. Moving to a non-supervisory role may reflect a desire on the part of mothers with newborns to reduce the responsibilities of formal employment when they return to work, but it may also be interpreted as part of a more general movement towards a weaker role in the labour market for women relative to men.

Women with newborns are less likely to move out of working at home and are more likely to move into working at home than all other groups of women. Interestingly, mothers with a school-entry child are more likely to stop working at home than most other groups of mothers, although they are not significantly different from men with children entering school. This suggests that women may be adjusting their place of work to fit new demands at the critical times. Somewhat surprisingly, women at the critical times of birth and school entry are generally less likely to change the time of day that they work than other groups of women.

Overall, birth and school entry are critical times for women in terms of alterations to some of the characteristics capturing the nature and conditions of work, including the weekly hours of work, the permanency of the position, the supervisory level and the place of work. While these modifications could be interpreted as reflecting changes in mothers' needs for particular work characteristics at the critical times, the movement away from permanent and supervisory positions could also be seen as a weakening in relative labour market position for women, even if desired by mothers at the time.

7.3 Changes in other work characteristics for women with newborns

This section investigates which factors are associated with changes in women's work characteristics after the birth of a child. Regression models for each type of change in characteristic were estimated containing various family variables (including mother's partnership, first or subsequent newborn, whether single or multiple birth, whether younger siblings follow and gap with older sibling) and variables covering the length of absence from work following birth and whether the mother is estimated to have returned within her maternity leave.[63] Table 7.5 presents the

[63] The length of absence from work has a maximum length of two years as the sample consists of mothers who are back in work by the second interview after birth. The 'returned with' maternity leave and 'returned with' maternity pay variables are defined by whether the mother is estimated to have been eligible for a particular right (using the work histories) and, for the maternity leave Additional Maternity Leave (AML) and Ordinary Maternity Leave (OML), returned within the entitlement period or soon after its termination.

factors that have a significant relationship with the likelihood of a particular change.[64] The size of the impact of the factor is illustrated using the predicted probabilities of change (or average change in the case of weekly hours) for two contrasting values of the significant factor in question.[65] Cells are left blank in the table when there is no significant relationship.

Mothers of newborns with partners are less likely to change employer or switch from a supervisory role to a non-supervisory position than lone mothers. These differences are quite substantial and provide another illustration of the relatively stronger position that mothers with partners hold in the labour market.

Women with a first newborn are less likely to change employer than those with a subsequent birth, but are more likely to change industry or occupation, leave self-employment for employment or change the time of day worked and to experience a greater decline in their weekly hours. This indicates that more adjustment in these work characteristics occurs following the first birth than after a subsequent birth, which is not surprising, although the lower rate of employer change indicates that these adjustments may often be being made with an ongoing employer or spell of self-employment. Mothers of newborns who are known to have a subsequent birth (indicated by the younger sibling variable) are less likely to change industry or occupation or leave the public sector, but are more likely to change the time of day worked than other mothers with newborns. The explanation for these differences is not obvious. A longer gap with an older sibling of the newborn is associated with a greater decline in work hours and with a greater likelihood of leaving the public sector, moving from self-employment to employment or moving to working at home. One possible reason for this difference may be that mothers with the longer gap have made more adjustments away from the work conditions associated with newborns in the intervening period since the previous birth and, therefore, need to make greater adjustments back upon the arrival of this newborn.

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[64] A wider range of factors could not be included in these regressions due to the small sample sizes in many cases where the sample is conditioned upon a particular initial state.

[65] The predicted proportions (or average change in the case of weekly hours) are calculated by assuming all observations take the chosen value for the factor under consideration while all other explanatory variables are held at their observed values.

Table 7.5 Factors related to changes in other work characteristics for women with newborns

	Predicted percentage							Predicted percentage				
Explanatory factors	**Change employer**	**Change industry/ occup.**	**Leave private sector**	**Leave public sector**	**Leave self-employ.**	**Predict. change in hours**	**Full-time to part-time**	**Perm. to temp.**	**Super. to non-super.**	**Non-super. to super.**	**Into work at home**	**Change time of day worked**
Lone mother	90.1								69.4			
Mother with partner	73.1								35.7			
First newborn	68.6	48.5			60.2	- 12.6						14.7
Subsequent newborn	79.0	38.7			17.2	- 2.6						7.6
Younger sibling		36.0		4.5								12.7
No younger sibling		45.9		13.5								9.0
Sibling one year older				7.8	18.1	- 6.4					3.9	
Sibling four years older				12.7	30.6	- 8.0					5.9	
Absence of six months	74.5	41.6						6.1		15.2		14.4
Absence of 12 months	83.6	51.8						9.6		8.8		9.9
Returned with AML	58.4					- 4.9	38.3	2.2	25.7			5.4
Returned without AML	81.5					- 8.3	55.6	9.6	46.4			13.4
Returned with OML	58.9					- 3.2		5.7	14.7			
Returned without OML	76.6					- 7.6		7.2	41.2			
Returned with SMP		48.5	14.6					11.2	46.7		6.9	17.9
Returned without SMP		35.4	6.3					5.1	27.3		1.8	6.3
Returned with MA	65.1	54.0	18.9					15.7	71.4			19.1
Returned without MA	75.3	40.7	8.0					5.8	33.8			9.2

Notes: The significance of changes in continuous variables was estimated using regression models, while the significance of changes in the binary discrete variables was estimated using logit models. A variable for multiple newborns was included in the regressions but was never significant. Returned with AML/ OML denotes those who were estimated to be eligible for maternity leave (AML or OML) and returned to work within the entitlement period or soon after its termination. Returned with Statutory Maternity Pay (SMP)/Maternity Allowance (MA) denotes those estimated to be eligible for maternity pay (SMP or MA).

It might be expected that mothers who take shorter absences from work following birth would be more likely to return to their previous employer and less likely to experience changes to poorer working conditions. Even though the maximum length of absence for this analysis is from birth to the second interview following birth and hence less than two years, there are several strong and significant relationships with the changes in work characteristics. In line with prior expectations, those with longer absences are more likely to change employer or occupation or industry, more likely to move from permanent to temporary work and less likely to be promoted from a non-supervisory to a supervisory position. However, contrary to expectations, they are also less likely to change the time of day worked.

Mothers who return within or at the termination of the entitlement period of maternity leave might also be expected to be more likely to return to their previous employer and less likely to experience changes to poorer working conditions. Women entitled to maternity leave (AML or OML) who return within the entitlement period or close to its termination are, in fact, less likely to experience changes in their work characteristics,[66] particularly those moves that might be regarded as undesirable, such as working shorter hours, moving from a permanent to a temporary position or moving from a supervisory to a non-supervisory position.[67] The inclusion of the length of absence from work following birth in the models means that these benefits of maternity leave are not deriving from the fact that the beneficiaries of these rights return to work sooner, on average, than other mothers. Hence, the evidence supports the case that maternity leave rights help women to maintain their position in the labour market following birth.

However, those women who are entitled to maternity pay (SMP or MA), regardless of when they return, are significantly more likely to experience a change in work characteristics than those not entitled,[68] including some of the less desirable changes in the permanency of position or supervisory level. Quite why the receipt of maternity pay should be associated with a greater likelihood of change is not immediately clear, given that the regressions in Table 7.5 control for related differences in the length of absence from work following birth and for any associations with maternity leave entitlement. Given recent extensions to the period of entitlement for maternity pay and the ongoing rising levels of maternity pay, this may be an undesirable side effect worthy of further investigation.

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[66] The finding that a change of employer is less likely for those returning with maternity leave rights within or close to the end of the period of entitlement is consistent with the same conclusion in Waldfogel (1995, 1998b).

[67] Previous work has found that the probability of being in full-time rather than part-time work following a birth is greater for those with a shorter absence from work (Joshi *et al.*, 1996) and for those who received maternity pay or MA or had no subsequent younger siblings (McRae, 1993). However, these results are not confirmed in the analysis presented here.

[68] The only exception to this is the change in employer for those entitled and not entitled to MA.

It is sometimes argued that changes in wages for mothers of newborns may be compensating for changes in other work characteristics. In order to investigate this, Table 7.6 presents the average wage growth by different types of changes in work characteristics that have occurred in the two years around birth.

Table 7.6 Average wage change and changes in other work characteristics for mothers with newborns

Employment characteristics before and after birth	Average % wage change	Number of mothers	Significant difference with groups
(1) No change in employer	9.0	133	
(2) Change in employer	5.9	207	
(1) No change in industry or occupation	6.0	205	
(2) Change in industry or occupation	8.1	165	
(1) Full-time	9.8	178	4
(2) Full-time to part-time	10.0	175	4
(3) Part-time	4.8	124	
(4) Part-time to full-time	–4.9	12	1,2
(1) Employed	8.7	479	2
(2) Employed to self-employed	–13.0	8	1
(3) Self-employed	–16.6	2	
(4) Self-employed to employed	*	0	
(1) Private sector	8.6	234	3,5,8,9
(2) Private sector to public sector	14.4	16	3,5,8
(3) Private sector to other sector	–21.7	4	1,2,4,6,7,9
(4) Public sector	9.7	161	3,5,8,9
(5) Public sector to private sector	–8.7	12	1,2,4,7,9
(6) Public sector to other sector	16.7	3	3,8
(7) Other sector	12.8	13	3,5,8
(8) Other sector to private sector	-46.5	1	1,2,4,6,7,9
(9) Other sector to public sector	38.9	3	1,3,4,5,8
(1) Permanent	8.8	437	
(2) Permanent to non-permanent	–0.7	25	
(3) Non-permanent	6.4	14	
(4) Non-permanent to permanent	11.1	12	
(1) Supervisory	9.7	124	
(2) Supervisory to non-supervisory	9.4	69	
(3) Non-supervisory	8.0	242	
(4) Non-supervisory to supervisory	8.0	43	
(1) Work at home	1.8	4	
(2) Work at home to work at other place	*	0	
(3) Work at other place	8.4	471	
(4) Work at other place to work at home	4.5	14	
(1) No change in time of day worked	8.4	251	
(2) Change in time of day worked	4.6	99	

Notes: * indicates no observations in the category with both wages recorded. The significance in the differences in the wage growth across groups was tested by estimating a wage growth regression for each work characteristic containing the set of dummy variables for each type of change (or absence of change).

Few changes in work characteristics are related to significant differences in wage growth. Being in full-time work rather than part-time work prior to birth is associated with higher wage growth, which is not surprising, but it is unexpected that those moving from part-time to full-time work have the lowest wage growth.[69] It might have been expected that the move to full-time work might have been associated with unusually high wage growth, given the literature of the 'part-time wage penalty'. Moving to self-employment rather than remaining in employment is also associated with lower wage growth. This may suggest some type of compensating move for women with newborns to self-employment, with more flexibility in work arrangements at the cost of a lower hourly income.

Average wage growth across sector movements has an interesting pattern: the highest growth is enjoyed by those moving into the public sector or moving from the public sector to the 'other' sector, while those with the lowest average growth are those moving into the private sector or from the private sector to the 'other' sector. Those who do not change sector have levels of wage growth lying in between. What is unclear from our data, though, is whether women who change from public to private sector (or vice versa) find their non-wage work conditions changing in a way that offsets the change in hourly wage.

7.4 Changes in other work characteristics for women with children entering school

This section investigates which factors are associated with changes in women's work characteristics at the time of school entry, using the same methods as Section 7.3. Table 7.7 presents the factors that have a significant relationship with the likelihood of a particular change; cells are left blank in the table when there is no significant relationship.

Lone mothers with a child entering school are more likely than mothers with partners to move from a part-time position to full-time or from a non-supervisory to a supervisory position, but are less likely to move from a temporary to a permanent position (Table 7.7). Mothers with partners are more likely to change the time of day they work over the period of school entry. Hence, the picture is mixed as to whether working lone mothers or mothers with partners fare better over the period of school entry in terms of the impact on their other work characteristics.

Mothers with a subsequent school entry and those with a younger child are more likely to change employer, which, when combined, somewhat surprisingly indicates that mothers with a 'middle' child entering school are those who are most likely to move employer. A move out of permanent work into temporary work is more likely

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[69] One possible explanation is that the move may be made by women who have lost part-time employment and have no option other than to take lower-paying jobs with longer hours. Or it may reflect a voluntary move in response to a need for greater overall earnings even at a lower hourly wage.

for mothers with multiple school entries (of twins or triplets) than for those with a single school entry.

Table 7.7 Factors related to changes in other work characteristics for women with children entering school

	Predicted percentage					
Explanatory factors	**Change employer**	**Part-time to full-time**	**Perm. to temp.**	**Temp. to perm.**	**Non-super. to super.**	**Change time of day worked**
Lone mother		21.3		40.8	22.5	7.7
Mother with partner		14.1		74.3	12.2	13.0
First school entry	50.9					
Subsequent school entry	62.6					
Single school entry			6.4			
Multiple school entry			39.4			
Younger sibling	65.5					
No younger sibling	53.7					

Notes: The significance of changes was estimated using logit models. A variable for the gap with older sibling was included in the regressions but was never significant.

Changes in work characteristics have more significant relationships with wage growth over the period of school entry (Table 7.8) than over the newborn period. Movement from employment to self-employment over the period of school entry is associated with substantially lower wage growth for mothers, while the reverse movement, from self-employment, is associated with much higher wage growth. Transitions between sectors have a very clear pattern of association with wage growth: moving from the private to the 'other' sector or from the 'other' to the public sector is associated with unusually low wage growth, while not changing sectors or moving from the public to the private sector is associated with unusually high wage growth. Mothers who move into working at home have significantly lower wage growth than mothers who remain not working at home. In all of these cases, because the categories of work characteristics cannot be defined as inherently desirable or not, it is not possible to discern whether higher wage growth goes hand-in-hand with a more general move towards favourable conditions or whether it is compensating for changes towards less desirable conditions.

Table 7.8 Average wage change and changes in other work characteristics for mothers with children entering school

Employment characteristics before and after birth	Average % wage change	Number of mothers	Significant difference with groups
(1) No change in employer	6.0	249	
(2) Change in employer	7.2	150	
(1) No change in industry or occupation	3.9	258	
(2) Change in industry or occupation	6.0	162	
(1) Full-time	7.1	148	
(2) Full-time to part-time	6.4	26	
(3) Part-time	5.0	258	
(4) Part-time to full-time	1.3	51	
(1) Employed	5.3	475	2,4
(2) Employed to self-employed	–52.0	2	1,3,4
(3) Self-employed	10.5	5	2,4
(4) Self-employed to employed	98.1	1	1,2,3
(1) Private sector	6.9	243	3,9
(2) Private sector to public sector	2.5	17	3,9
(3) Private sector to other sector	–22.3	6	1,2,4,5,7
(4) Public sector	5.5	149	3,9
(5) Public sector to private sector	8.7	9	3,9
(6) Public sector to other sector	–10.1	3	
(7) Other sector	11.3	9	3,9
(8) Other sector to private sector	–2.5	7	
(9) Other sector to public sector	–30.0	4	1,2,4,5,7
(1) Permanent	7.2	417	2,4
(2) Permanent to non-permanent	–13.6	21	1
(3) Non-permanent	–0.2	15	
(4) Non-permanent to permanent	5.5	29	1
(1) Supervisory	9.1	109	2,4
(2) Supervisory to non-supervisory	–1.2	39	1
(3) Non-supervisory	4.4	287	
(4) Non-supervisory to supervisory	10.0	39	1
(1) Work at home	–0.1	11	
(2) Work at home to other place	1.2	9	
(3) Work at other place	5.8	459	4
(4) Work at other place to work at home	–24.2	4	3
(1) No change in time of day worked	6.6	227	
(2) Change in time of day worked	3.3	126	

Notes: The significance in the differences in the wage growth across groups was tested by estimating a wage growth regression for each work characteristics containing the set of dummy variables for each type of change (or absence of change).

If it is reasonable to assume that permanent positions are more desirable than temporary ones and that supervisory roles are more desirable than non-supervisory positions, the underlying driving force of the changes can be identified. In both cases, mothers who remain in the more desirable state (permanent or supervisory positions) experience significantly higher wage growth than those who move to the less desirable state and than those who remain in the less desirable state. This suggests that wage growth and movements towards more desirable work conditions

may go hand-in-hand rather than being compensatory. This is indicative that changes in these other work characteristics, rather than being part of a repackaging towards a more desirable combination of wage and work characteristics for mothers as their home circumstances alter, may be an undesired element of a more general weakening in the labour market position of mothers.

7.5 Summary on other work characteristics

There are differences in several work characteristics between mothers and fathers that are not present prior to the arrival of children: average employer tenure is lower for mothers; mothers work substantially fewer hours than fathers and are far more likely to be in part-time work; mothers are less likely to be in permanent or supervisory positions than fathers; and mothers and fathers tend to work at different times of the day. Hence, the 'family gap' in work extends beyond simple participation and the hourly wage.

Several of these work characteristics exhibit an unusual degree of change for women around the time of birth and school entry. The proportions changing their employer are significantly higher for women at these times than for other groups of women and for men at the same critical times. They are also critical times for women in terms of alterations to the weekly hours of work, the permanency of position, the supervisory level and the place of work. While these modifications could be interpreted as reflecting changes in mothers' needs for particular work characteristics at the critical times, the movement away from permanent and supervisory positions could also be seen as a weakening in relative labour market position for women, even if desired by mothers at the time.

Different types of mothers are more prone to make changes than others. Mothers with partners are less likely to experience changes over birth than lone mothers, although the picture for the two groups is more mixed over the time of school entry. Women with a first newborn are less likely to change employer than those with a subsequent birth, but are more likely to experience changes in several other work characteristics. This suggests that more adjustments need to be made on the arrival of the first-born, although the lower rate of employer change indicates that these changes may often be being made with an ongoing employer or spell of self-employment. Mothers with a 'middle' child entering school are more likely to change employer than those with a first or last child entering school. Mothers of newborns who are known to have a subsequent birth are less likely to change industry or occupation or leave the public sector, but are more likely to change the time of day worked than other mothers with newborns. A longer gap with an older sibling of the newborn is associated with a greater probability of change in several characteristics, possibly because mothers with the longer gap have made more adjustments away from the work conditions associated with newborns.

It might be expected that mothers who take shorter absences from work following birth or return having taken maternity leave rights, would be more likely to return to

their previous employer and less likely to experience changes to poorer working conditions. Those with longer absences are more likely to change employer, or occupation or industry, more likely to move from permanent to temporary work and less likely to be promoted from a non-supervisory to a supervisory position. However, contrary to expectations, they are also less likely to change the time of day worked. Women returning to work having taken maternity leave rights are less likely to experience changes in their work characteristics, particularly those moves that might be regarded as undesirable, such as working shorter hours, moving from a permanent to a temporary position or moving from a supervisory to a non-supervisory position, suggesting that maternity leave rights may indeed be helping women to maintain their position in the labour market following birth. However, those women who were entitled to maternity pay are significantly more likely to experience a change in work characteristics than those not entitled, including some of the less desirable changes in the permanency of position or supervisory level. Given recent extensions to the period of entitlement for, and the ongoing rising levels of, maternity pay, this may be an undesirable side effect worthy of further investigation.

It is sometimes argued that changes in wages for mothers of newborns may be compensating for changes in other work characteristics and the case may also be made that there are compensating changes for mothers with children entering school. A few changes in work characteristics are related to significant differences in wage growth for mothers with newborns: movements between part-time and full-time work, between self-employment and employment and between sectors. For mothers with children entering school, there are significant changes in wage growth for different categories of changes between employment and self-employment, across sectors, between permanent and non-permanent positions, between supervisory and non-supervisory roles and between working at home and working elsewhere. However, for most of the work characteristics, it is not possible to identify which is the most desirable state for mothers, which means that it is not feasible to discern whether higher wage growth goes hand-in-hand with a more general move towards favourable conditions or whether it is compensating for changes towards less desirable conditions. It could be argued that permanent positions and, possibly, supervisory roles are more desirable than the non-permanent and non-supervisory alternatives. For mothers with children entering school, those who remain in the more desirable state (permanent or supervisory positions) experience significantly higher wage growth than those who move to remain in the less desirable state. This suggests that wage growth and movements towards more desirable work conditions may go hand-in-hand rather than being compensatory.

8 Childcare around school entry

The panel childcare data available in both the British Household Panel Survey (BHPS) and the Families and Children Study (FACS) provide an unusual opportunity to analyse changes in childcare choices as children age. Cross-section data show that the proportions of children using different types of childcare very much depend on the age of the child, but only panel data can show how individual children move from one type of care to another as they grow up. This chapter considers changes in childcare use and type for working mothers around the time of school entry and the impact of pre-school childcare choices on mothers' future employment after school entry. It should be noted that childcare information is only collected from children of working mothers in both surveys and the description of childcare usage is only for this group.

8.1 Changes in childcare arrangements

Table 8.1 presents a cross-sectional view of childcare use prior to and after school entry for families with working mothers, where the initial observation is from the autumn in which the child is aged three in the September and the latter observation from the autumn in which the child is aged five in the September.[70] While the numbers presented in Table 8.1 are for all mothers in work either before **or** after school entry, the proportions are very similar for a sample of mothers who were in work both before **and** after school entry, showing that the changes in childcare choices reflect real changes within given families rather than a changing composition

[70] As explained in Section 4.2.2 above, this ensures that the child will enter school during the interim period.

of mothers in work.[71] The childcare type (and also the payment measures presented later) is the total of all types of care used for all children in the family.

The most marked change in childcare use over the period of school entry is the substantial shift towards using care only from within the immediate family: this jumps from 20 per cent to 25 per cent when the first child enters school and from 31 per cent to 43 per cent when a subsequent child enters school.[72] This is not surprising as 'within immediate family' includes mothers who only work during school hours, while school entry means fewer childcare hours need to be provided, possibly allowing some families to cover the remaining hours themselves. Interestingly, the use of the most popular form of care prior to school entry – informal care (care provided by relatives and friends outside of the immediate family) – increases by similar amounts for both first school entry and subsequent school entry. Again, this may reflect that, now that parents need fewer hours to be covered outside of school hours, the difference may be made up by informal sources. Together, these changes show a substantial movement away from formal sources of care as children start school: 54 per cent of families with a working mother whose children have not yet started school used some type of formal care, but only 29 per cent of families with a working mother used formal childcare where at least two children had started school.

Table 8.1 Childcare type prior to and after school entry

Percentage using childcare type	First school entry		Subsequent school entry	
	Prior to entry	After entry	Prior to entry	After entry
Within immediate family	19.9	25.0	31.1	43.0
Informal	26.4	31.3	25.9	28.4
Nanny/mother's help	2.4	5.3	2.0	2.8
Nursery	16.2	4.3	6.1	0.9
Childminder	6.8	9.8	6.1	4.8
Other single formal type	2.4	5.7	5.4	7.4
Informal + single formal type	15.5	11.0	14.2	8.9
Informal + mixed formal	2.2	1.6	2.5	1.0

Continued

[71] Very similar proportions were calculated for a sample of mothers in work at both interviews partly because most mothers in work at either interview were in work at both interviews. The numbers of observations for the more restricted sample were 359 and 362 prior to and after entry, respectively, for first school entry and 498 and 499 prior to and after entry, respectively, for subsequent school entry.

[72] The proportion prior to school entry for a subsequent entry (31 per cent) is different from that after school entry for the first entry (25 per cent) because care arrangements may have altered in the interim and because not all first entries will have subsequent entries.

Table 8.1 Continued

Percentage using childcare type	First school entry		Subsequent school entry	
	Prior to entry	After entry	Prior to entry	After entry
Mixed formal	8.2	6.1	6.8	2.7
Total	100.0	100.0	100.0	100.0
Number of observations	413	492	557	672

Notes: The sample consists of mothers in work at the time of the interview either prior to school entry or after school entry. Childcare type covers all care used for all children in the family. 'Within immediate family' contains those mothers who use only self-care or care by a partner and mothers who report that they work at home or only work during school time. 'Informal care' includes care by relatives or friends, which may be paid or unpaid. The 'other formal' type of care includes school clubs and institutional settings other than nurseries and care by au pairs and other individuals who do not include relatives or friends and are not nannies, mother's helps or childminders. All categories include mothers who may use 'within immediate family' in addition to the listed category, but the 'within immediate family' category excludes the use of any other type of care.

There are also substantial changes in childcare usage over school entry within the formal types of care. Not surprisingly, the proportions of families with children attending nursery drops dramatically as children enter school. Less expectedly, the use of nannies/mother's helps and childminders both increase quite dramatically when the first child enters school (the use of nannies and mother's helps more than doubles), but the use of childminders declines after the school entry of a subsequent child. These patterns may indicate that nannies, mother's helps and childminders are most useful to families with both school and pre-school children, while nurseries suit those with only pre-school children better. The use of a single type of other formal care also rises with school entry; it is not explicitly stated in the surveys, but this is most likely capturing care in school clubs and by au pairs. Although the proportion of families using this type of care more than doubles, its use remains relatively uncommon; whether this is because mothers do not wish to use such school clubs or whether there is a shortage of such clubs is something on which our data can shed little light.

Finally, there is also a marked decline in the use of mixed arrangements (including across informal and formal) with school entry. At first sight, this runs counter to the hypothesis that childcare arrangements become more complicated upon school entry because of the need for a mixture of sources of care.[73] However, the decline in mixed arrangements may just reflect the general movement away from formal care as children start school; it may well be the case that those families using 'within immediate family' and informal care, do find arrangements more complicated when their child attends school.[74]

[73] Skinner (2003) investigates the issues of coordinating childcare and mothers' work in greater detail.

[74] Furthermore, there is also the issue of selection bias: those mothers who find it so hard to coordinate childcare when a child starts school that they stop working altogether will not feature in this analysis.

Table 8.2 makes use of the panel element of the data to consider whether school entry is a time of unusually high change in childcare use by examining the propensity to remain in the same type of care across pre-school children, school-entry children and primary-school children. The pre-school children and primary-school children samples are defined by the age of the youngest child in the family and include families who remain in the same category throughout the two-year period without any school entry or new births during the two years.

Table 8.2 Changes in childcare type

Percentage with unchanged childcare type two years later: Initial type of care	Pre-school children	First school entry	Subsequent school entry	Primary-school children
Within immediate family	59.5	58.7	69.7	64.9
Informal	51.5	67.8	65.2	63.2
Nanny/mother's help	15.8	50.0	18.2	14.3
Nursery	39.8	11.4	3.2	0.0
Childminder	31.8	59.3	28.1	36.5
Other single formal type	15.0	30.0	25.9	36.1
Informal + single formal type	27.3	16.7	12.9	20.8
Informal + mixed formal	16.7	0.0	0.0	25.0
Mixed formal	14.8	3.2	2.6	9.1
All types	41.3	38.8	43.1	53.8
Number of observations	816	358	497	1,909

Notes: Sample consists of mothers in work at both interviews. The pre-school children and primary-school children samples are defined by the age of the youngest child in the family and include families who remain in the same category throughout the two-year period without any school entry or new births during the two years.

Overall, the propensities for families with children entering school to remain in the same type of care (39 per cent and 43 per cent for first and subsequent school entries respectively) are very similar to that for pre-school children (41 per cent) and slightly less than that for primary-school children (54 per cent). School entry marks a time of unusually high change for those initially using nannies or mother's helps or childminders. Somewhat surprisingly, stability for children using nursery-type care is much lower in the pre-school group than in the school-entry group, but further investigation of the data shows that this reflects substantial movements into and out of nursery-type care with corresponding movements out of or into other types of care for the pre-school group, while the movement among the school-entry group is a simple movement out of nursery care. The propensity to remain in the same type of care for those families initially using a single type of other formal care is greater for school-entry than for pre-school children, but is in line with greater stability in these categories for families with primary-school children.

Families with working mothers and children entering school are less likely than those with pre-school children to start paying for childcare: over the two-year period, five per cent of those with a school entry start to pay for care compared with eight per cent for those with pre-school children (first panel, Table 8.3). However, this fits with the pattern of an even smaller propensity to start paying for care for families with primary-school children. But school entry does mark a distinct time in terms of stopping paying for care: 14–15 per cent of families stop paying for care over school entry, compared with 11 per cent of families with pre-school children and seven per cent of families with primary-school children. This is not surprising, given the movement away from formal sources of care at the time of school entry and the greater reliance on care from within the immediate family.

Table 8.3 Changes in payment for childcare

	Pre-school children	First school entry	Subsequent school entry	Primary school children
Initial year/two years later				
No pay/no pay	28.0	26.7	37.7	52.2
No pay/pay	7.9	4.8	4.5	4.2
Pay/no pay	10.6	13.5	15.2	7.3
Pay/pay	53.6	55.1	42.7	36.4
Change in average weekly childcare spending				
All families	–£11.42	–£24.40	–£28.84	–£2.81
Families who pay at some point	–£14.13	–£30.74	–£42.55	–£5.43
Families who pay at both points	–£14.05	–£36.83	–£53.45	–£2.92

Note: Sample consists of mothers in work at both interviews.

The decline in average weekly spending on childcare is unusually high over the period of school entry (second panel, Table 8.3). The average declines per family are £24 and £29 for those with a first and subsequent school entry respectively, compared with £11 for those with pre-school children and £3 for those with primary-school children. Ignoring the proportion of families who were not paying at either the initial interview or the second interview produces an even larger difference in the changes: childcare expenditure declines of £31 and £43 for first and subsequent school entry, respectively, compared with £14 for families with pre-school children and £5 for those with primary-school children. The final line of Table 8.3 shows that the differences are even larger when averaged over only those families who pay at both interviews, indicating that the reduction in average childcare spending over school entry is not just due to some families no longer

paying for care, but also due to sizeable reductions in costs for those who continue to pay.[75]

8.2 The impact of childcare choices on mothers' future employment

One other question to consider is whether the choice of childcare arrangements for pre-school children helps the transition into post-school-entry arrangements and, thereby, helps mothers to remain in employment. In reality, this is an exceedingly difficult question to answer: differences in behaviour between women who use different childcare types cannot be attributed to the choice of childcare because other factors may be simultaneously influencing both a woman's preferences for different types of childcare and her propensity to work.[76]

On the other hand, it is still informative to examine the correlations and associations, and Table 8.4, therefore, presents the proportions of mothers who are working prior to school entry who remain in work after school entry by type of childcare arrangement prior to school entry. It also shows the average change in working hours for those mothers who do remain in work. Comparative proportions remaining in work and average changes in hours are also included for mothers of pre-school children and primary-school children. The significance of the differences across childcare types within each of these three groups was tested using logit models for the proportion remaining in work and a regression model for the change in mothers' weekly work hours.

[75] Some of the latter may be due to the family no longer paying for care for the school-entry child while continuing to pay for care for a younger sibling. The fact that the largest decline in spending occurs when a subsequent child enters school, when a younger sibling is less likely to be present, suggests that there is a substantial reduction in cost purely for the school-entry child. Unfortunately, the BHPS part of the data used in this report does not permit an analysis of costs per child.

[76] See Brewer and Paull (2004) for a longer exposition of this point.

Table 8.4 Childcare prior to school entry and mother's work subsequent to school entry

	Percentage of mothers working two years later			Average change in weekly work hours for those still working		
Initial childcare	**Pre-school children**	**School entry**	**Primary school**	**Pre-school children**	**School entry**	**Primary school children**
(1) Within immediate family	84.8	80.4	87.7	+ 1.7	+ 2.5	+ 2.8
(2) Informal	85.3	88.1	93.6	+ 0.8	+ 1.1	+ 1.9
(3) Nanny/mother's help	86.4	90.5	100.0	+ 1.4	- 0.1	- 0.1
(4) Nursery	89.3	91.1	100.0	+ 0.8	+ 2.1	- 2.7
(5) Childminder	94.7	96.8	96.9	+ 1.3	+ 0.4	+ 1.0
(6) Other single formal type	62.9	92.5	93.5	+ 3.0	+ 5.4	+ 1.4
(7) Informal + single formal type	87.0	90.9	92.5	+ 2.8	+ 2.1	+ 1.1
(8) Informal + mixed formal	100.0	95.6	100.0	- 2.3	- 5.2	- 1.0
(9) Mixed formal	90.0	95.8	91.7	+ 4.4	- 0.1	- 4.2
All types	86.7	88.4	91.5	+ 1.5	+ 1.5	+ 2.0
Significant differences between groups	5 & 1, 2, 7, 6 & all others	1 & 2, 4, 5, 6, 7, 9 2 & 5, 9	1 & 2, 5, 6, 7	7 & 2, 4, 8 9 & 2, 4, 8	6 & 2, 3, 4, 5, 7, 8, 9 8 & 1, 2, 4, 5, 7, 9 9 & 1	1 & 2, 4, 5, 6, 7, 9 2 & 4 9 & 2, 5, 6, 7

Notes: Sample consists of mothers who were working at the initial interview. The significance of differences between the groups was calculated using a logit model for the probability of still working and a regression model for the hours change. Group 8 for pre-school and primary-school children and groups 3 and 4 for primary-school children contained very few observations (12, 4, 27 and 15 respectively) and could not be included in the logit models because they predicted success perfectly.

Working mothers who only use help from within the immediate family or informal sources of care are significantly less likely to be in work after school entry than those who use most other types of care. This may initially seem surprising, as care from within the family or other relatives and friends might be thought to be the most flexible and most able to continue once a child starts school. However, non-formal types of care may be more likely to be used by mothers who have less attachment to the labour market or who command lower wages, and are, therefore, more likely to move into and out of work. There is some support for this latter argument in the fact that use of care only from the immediate family for primary-school children is also associated with a lower probability of the mother being in work two years later. For pre-school children, those using care from within the immediate family or informal sources do have lower-than-average probabilities that the mother will still be working two years later, but the differences are not significant. Indeed, the only significant differences for this group are that use of childminders is associated with a greater likelihood that the mother will remain in work and that use of other single formal types of care is associated with a lower probability. There is no obvious explanation for this pattern, particularly as the 'other' type of formal care cannot be specifically identified.

For mothers who remain in work over school entry, the change in work hours does not have a distinct pattern across childcare types. Those who use a single 'other' type of formal care experience a greater average increase in work hours than other types of childcare, while those who use a mix of informal and formal care prior to school entry experience a much greater decrease in hours. For pre-school children, mixes of different types of care are associated with larger average increases in work hours, while those using care from within the immediate family and informal sources have the greatest average rises in work hours for those with primary-school children.

Overall, there is a clear association between mothers' continued employment over school entry and the use of different types of childcare. In particular, mothers who use formal types of care for pre-school children seem to find it easier to continue working after school entry than those who use only informal care. However, this relationship may not be a causal one, but may instead reflect that women with lower labour market attachment are less likely to use formal care.

8.3 Summary on childcare

As would be expected, the time of school entry marks a substantial movement in families' use of childcare away from formal sources: 54 per cent of families with a working mother whose children have not yet started school used some type of formal care, but only 29 per cent of families with a working mother used formal childcare where at least two children had started school. This movement includes increases in the proportions of families who manage without any care from outside the immediate family or who use only informal sources of care, such as relatives and friends. Within the different types of formal care, the proportion of families using nurseries drops dramatically as children enter school, while the use of nannies/

mother's helps and childminders both increase when the first child enters school, indicating that nannies, mother's helps and childminders may be most useful to families with both school and pre-school children, while nurseries may suit those with only pre-school children better. The use of a single type of other formal care, most likely capturing care in school clubs and by au pairs, also increases with school entry. Although the proportion of families using this type of care more than doubles, its use remains relatively uncommon. There is also a marked decline in the use of mixed arrangements as children enter school, which, at first sight, runs counter to the hypothesis that childcare arrangements become more complicated upon school entry.

The propensities for families with children entering school to remain in the same type of care (39 per cent and 43 per cent for first and subsequent school entries respectively) are very similar to that for pre-school children (41 per cent) and slightly less than that for primary-school children (54 per cent). Families with children entering school are less likely than those with pre-school children to start paying for childcare, but they are more likely to do so than families with only primary-school children. However, school entry does mark a distinct time in terms of stopping paying for care: 14–15 per cent of families stop paying for care over school entry, compared with 11 per cent of families with pre-school children and seven per cent of families with primary-school children. The decline in average weekly spending on childcare is unusually high over the period of school entry, partly due to the fact that some families stop paying for care, but also due to sizeable reductions in costs for those who continue to pay.

Working mothers who only use help from within the immediate family or informal sources of care immediately prior to school entry are significantly less likely to be in work after school entry than those who use most other types of care. This suggests that mothers' continued employment over school entry may be facilitated by the use of formal types of care for pre-school children, which may provide an additional justification for Government financial support of formal pre-school childcare rather than of informal sources. However, the relationship between using care from within the immediate family or informal care for pre-school children and the continued employment of mothers over school entry may not be a causal one; but it could be due to mothers with lower labour market attachment being more likely to use these types of care.

9 Conclusions

This report has comprehensively examined changes in women's work participation, hourly wage and other employment characteristics around the potentially critical times of childbirth and school entry. In this concluding chapter, the main findings are drawn together to create a complete picture of women's changing position in the labour market over the lifetime profile of family development (Section 9.1). Specific issues for future policy discussion or further research are highlighted in Section 9.2. In closing the report, Section 9.3 concludes whether, and in what ways, newborns and new schools are critical times for women's employment and how well the evidence has supported the theory that gender differences in the formal labour market stem from the division of parental duties between mothers and fathers in the home.

9.1 A summary profile over the lifetime

Prior to the arrival of children, men and women are equally likely to be working: 81 per cent of men and 82 per cent of women are in formal paid work. However, the average female wage is 91 per cent of the average for men prior to the arrival of children, a discrepancy that is not explained by observable differences in demographic and work factors. Women also differ from men in several work characteristics: they are less likely to work in the private sector and are more likely to be employed in the public sector; they are less likely to be self-employed than men; and they work fewer hours and are less likely to be in full-time work. There are two interpretations to the existence of these gender differences prior to children: First, part or all of these particular types of differences may be due to factors not related to children. Alternatively, the differences may be due to the anticipated effects of children. It is also not clear whether the differences arise from differences in what men and women want from work or from differences in how employers treat men and women.

The presence of children has a dramatic effect on the relative position of men and women in the labour market. With children present in the household, 64 per cent of mothers are in work, compared with 89 per cent of fathers. The average female wage is just 67 per cent of that of men, and most of this difference is not explained

by differences in demographic and work characteristics. Differences in other work characteristics are also associated with the presence of children: average employer tenure is lower for mothers than fathers; mothers work substantially fewer hours than fathers and are far more likely to be in part-time work; mothers are less likely to be in permanent or supervisory positions than fathers; and mothers and fathers tend to work at different times of the day. Hence, the 'family gap' applies to a range of work characteristics beyond simple work participation and the wage.

9.1.1 Newborns

The evolution of these differences is not uniform. The proportion of women in work plummets immediately in the year following the first birth to just over 40 per cent and immediately begins a steady climb back up, but the birth of the first child marks the start of a gradual decline in women's relative wage which lasts for approximately ten years. The proportion of female workers in full-time as opposed to part-time work plummets to around 40 per cent in the year immediately following the first birth, stagnates at this level for the following ten years and then rises again.

Birth marks a critical point in this evolution. Not surprisingly, women with newborns are significantly more likely to move out of work than women at any other stage of family formation or men at the time of birth. The arrival of a new child also marks a sudden drop in the propensity to move into work for women, which persists throughout the pre-school years. Wage growth for women over the time of birth is also lower than it should be according to the general pattern over family formation: according to the trend, wage growth for women should be two to three percentage points higher than its actual level. In comparison with men, the differences are even more marked: while wage growth for women is roughly equal to or greater than that for men at every other stage of family formation, it is substantially lower for women than for men around birth. Several other work characteristics exhibit an unusually high degree of change for women around the time of birth. The proportion changing their employer is significantly higher for women at this time. Birth also marks a critical point when women are especially likely to shorten their work hours, to move towards non-permanent and non-supervisory roles and to start working from home. Some of these changes in other work characteristics may be adjustments desired by women in the face of new home circumstances. Indeed, it could be argued that the correlations between wage growth and modifications in some work conditions (whether working part-time, whether in self-employment and sector of employment) reflect a rebalancing in the package of financial return and other work characteristics. Other changes, however, such as the move towards non-permanent or non-supervisory work, may reflect a general weakening in labour market position, which coincides with, rather than compensates for, the decline in relative wage.

First births have a different impact from subsequent births. There is limited evidence that wage growth is lower following the first birth than for subsequent births. Mothers are less likely to change employer following the first than a subsequent birth, but are more likely to experience changes in several other work characteristics,

suggesting that while more adjustments need to be made on the arrival of the first-born, these changes may often be being made with an ongoing employer or within a spell of self-employment. Mothers who go on to have more children are less likely to change industry or occupation or to leave the public sector after a birth, but are more likely to change the time of day worked, than other mothers with newborns. Longer gaps between births are associated with a greater change in several characteristics, possibly because mothers with the longer gap have made more adjustments away from the work conditions associated with newborns.

Although roughly half of all mothers will return to work during the first year after a birth, only an additional quarter will return by the end of five years since birth. Indeed, even by eight years after birth, over ten per cent of mothers have never returned to formal paid work at any point. The speed of return decreases for subsequent children: the average length of absence following birth is 20 per cent longer for a second birth than for a first birth and 50 per cent longer in the case of third or subsequent children. However, mothers working prior to a birth have significantly shorter absences than those who were not working; most mothers are working prior to the first birth (74 per cent), while many are not working prior to a subsequent birth (46 per cent). Conditioning on whether the mother was working prior to the birth, mothers actually return more quickly following subsequent births than first births. Mothers with partners who go on to have another child also spend more time out of work than those for whom family formation is complete. Those with longer gaps between births tend to return more quickly, suggesting that mothers find it more worthwhile to return to work more quickly if the interruptions of birth are further apart.

There are two competing explanations for the fact that mothers working prior to birth tend to return more quickly to work afterwards: First, women may vary in their attachment to work and those undertaking some work between births may simply have a higher propensity to be in work. Second, there is dynamic persistence in labour market behaviour, so the choices that women make after the first birth directly affect the options open to them after subsequent births. To the extent that there is a genuine persistence, focusing policy on encouraging mothers to return to work between births could be an important factor in reducing the length of absence from work after subsequent births.

For mothers entitled to statutory maternity leave or pay, there is a tendency to return to work, either when the period of paid leave ends or when the period of unpaid leave ends if it is longer and the mother can afford to continue beyond the paid period. In addition, the evidence suggests that maternity pay may mean women can afford to extend their absence even beyond the end of the period of maternity pay. There is also evidence indicating that maternity leave may encourage some women to shorten their absence in order to be eligible for the associated rights.

From a policy perspective, one of the most important questions is whether longer absences following birth or using maternity entitlements have long-term impacts for women in the labour market. In contrast to the findings in previous work, the

analysis in this report did not identify any strong evidence that longer absences from work following birth reduce the probability of a mother working in the future. Previous studies have concluded that those with longer absences from work following birth suffer a greater wage penalty in the future than those with shorter absences and that returning having taken maternity leave within the entitlement period, has an even larger positive effect on future wages; however, this report finds only very limited evidence that longer absence from work following birth may be detrimental to wage levels for women when they return to work and does not identify any evidence that maternity rights are beneficial to future wage growth. This may reflect that such relationships have genuinely changed over time, or that our sample is too small to identify such effects sufficiently accurately, or that the correlations identified by previous studies are actually due to other factors that affect both length of absence after birth and long-term labour market outcomes. Mothers with longer absences following birth are more likely to change employer or occupation or industry, more likely to move from permanent to temporary work and less likely to be promoted from a non-supervisory to a supervisory position. However, they are less likely to change the time of day worked. Women returning to work having taken maternity leave rights are less likely to experience changes in their work characteristics, particularly those moves that might be regarded as undesirable, such as working shorter hours or moving from a permanent to a temporary position or moving from a supervisory to a non-supervisory position, suggesting that maternity leave rights may indeed be helping women to maintain their position in the labour market following birth. However, those women who are entitled to maternity pay are significantly more likely to experience a change in work characteristics than those not entitled, including some of the less desirable changes in the permanency of position or supervisory level, for reasons that are not clear.

Although mothers may return to formal paid work quickly after birth, they may not remain permanently in employment because of natural fluctuations in employment, because of the interruption of a subsequent birth, because of the discovery that mixing work and motherhood is not as expected or because home circumstances alter as the child ages. Indeed, the return to work after birth is often temporary or interrupted by a subsequent birth: ten years after birth, 51 per cent of mothers have had a subsequent birth, 17 per cent have permanently returned to work, 27 per cent have temporarily returned and five per cent have not returned at all. Even in the absence of a subsequent birth, mothers are substantially less likely to remain permanently in work than would be expected from normal labour market dynamics: while 38 per cent of mothers who have returned to work within ten years and have not had a subsequent birth have remained permanently in work, some 61 per cent of men in the same position have remained permanently in work. Mothers are more likely to return to work only temporarily following a subsequent birth than a first birth, possibly reflecting that it is easier to remain in work with a single child than with multiple children.

9.1.2 School entry

Four or five years following birth, mothers face a second crucial point: the initiation of compulsory schooling. In the June prior to school entry, some 53 per cent of mothers are reported as being in work. By the September after school entry, 57 per cent of mothers are working. For mothers with their last child entering school, the proportion in work rises from 60 per cent to 67 per cent over the school entry. Given the argument of some recent policy debate that mothers should be able to undertake formal paid work once their youngest child starts school, this increase in work participation of seven percentage points over the period of school entry may seem surprisingly small. However, this change in aggregate work participation at the time of school entry masks a high degree of churning: mothers are not only entering work at this point, but also leaving work. The proportion of mothers who switch between working and not working over school entry is high regardless of the child order: 19.5 per cent for those with their first child, 17.5 per cent for those with a middle child and 16.7 per cent for those with their last child entering school. Mothers with their last child entering school are both more likely to enter work and to remain in work over school entry, while those with a larger gap between the school-entry child and younger children are more likely to enter work and those with a smaller gap between the child entering school and older siblings are more likely to remain in work. Hence, while school entry may appear to be a critical period only for mothers with their last child starting school according to the aggregate statistics, examination of the underlying transitions suggests that it may be a critical period in both directions for a substantial proportion of mothers.

Compared with other times in the lifetime profile, school entry marks an acceleration of movement rather than a change in direction. School entry marks both the last years of unusually high exit from work for women and the first years of unusually high entry into work; combined, this leads to a time of unusually high change in women's labour market participation.

Mothers experience significantly lower wage growth over the period of school entry: according to the lifetime trend over family formation, wage growth for women should be two to three percentage points higher than its actual level over this period. Wage growth is also substantially lower for women than for men around school entry. Several other work characteristics exhibit an unusual degree of change for women around the time of school entry. The proportion changing their employer is significantly higher for women at this time than for other groups of women and for men over school entry. Interestingly, a 'middle' child entering school is associated with a greater likelihood of employer change than a first or last child entering school. School entry is also a critical time for women in terms of alterations to the permanency of position and the place of work. As was the case with changes around the time of birth, it is not possible to distinguish directly whether these alterations are desired or forced upon mothers by their circumstances. Wage growth around the time of school entry is related to changes between employment and self-employment, across sectors, between permanent and non-permanent positions, between supervisory and non-supervisory roles and between working at home and

working elsewhere. Mothers who remain in permanent or supervisory positions experience significantly higher wage growth than those who move to non-permanent or non-supervisory positions and than those who remain in non-permanent or non-supervisory positions. This suggests that wage growth and movements towards more desirable work conditions may go hand-in-hand rather than being compensating.

The time of school entry marks a substantial movement by families away from using formal sources of childcare: prior to first school entry, 54 per cent of families with a working mother use some type of formal care, compared with 29 per cent after a subsequent school entry. This movement includes increases in the proportions of families who manage without any care from outside the immediate family or who use only informal sources of care, such as relatives and friends. Within the different types of formal care, the proportion of families using nurseries drops dramatically as children enter school, while the use of nannies/mother's helps and childminders both increase when the first child enters school, indicating that nannies, mother's helps and childminders may be most useful to families with both school and pre-school children, while nurseries may suit those with only pre-school children better. The proportion of families using a single type of other formal care more than doubles, but its use remains relatively uncommon (this category of childcare is most likely capturing care in school clubs and by au pairs). There is a marked decline in the use of mixed arrangements as children enter school, which at first sight runs counter to the hypothesis that childcare arrangements become more complicated upon school entry.

While the rate of change in childcare type is not unusually high for families when there is a child entering school, school entry does mark a distinct time in terms of stopping paying for care: 14–15 per cent of families stop paying for care over school entry, compared with 11 per cent of families with pre-school children and seven per cent of families with primary-school children. The decline in average weekly spending on childcare is also unusually high when a child enters school, partly due to the fact that some families stop paying for care, but also due to sizeable reductions in costs for those who continue to pay.

Working mothers who only use childcare from within the immediate family or informal sources of care immediately prior to school entry are significantly less likely to be in work after school entry than those who use most other types of care. However, this relationship may not be a causal one, but may instead be due to the fact that mothers with lower labour market attachment are less likely to use formal care.

As children grow up through the school years, mothers' work participation and hours of work rise very steadily, but there is far from a complete convergence back to the position of men. In contrast, the steady decline in women's wages relative to men through the accumulation of several short periods of low growth around each birth and each school entry, is not greatly reversed during the school years, with the relative wage stagnating for most of the remaining period with children at home.

Many of the gender differences persist after all the children have become adults or left home. Only 74 per cent of women are in formal paid work compared with 84 per cent of men even when the children have left. The average wage for women is still only 72 per cent of that for men, only a small fraction of the difference being explained by differences in demographic and work characteristics including employer tenure and total work experience. Women continue to have lower employer tenure than men, to work shorter hours and have a greater likelihood of being in part-time work, to have a greater propensity to be in non-supervisory positions and to work at different times of day than men even once the children have left.

9.1.3 Variation across mothers

This overall picture of the development of women's role in the labour market is surprisingly consistent across different types of women and mothers. The timing of fertility has relatively little impact. Women having children later in life return to work more quickly on average than younger mothers, but this is not an age effect per se and is explained by the fact that older mothers are more likely to be in work prior to the birth. Wage growth is lower for older mothers when a child enters school, but this may be explained by the fact that wage growth slows with age for all workers. Somewhat surprisingly then, the timing of fertility does not appear to be important in the evolution of work behaviour. Multiple births are associated with longer absences from work following birth, and a move out of permanent work into temporary work is more likely for mothers with multiple children entering school than for those with a single school entry.

The presence of a partner generally seems to facilitate mothers' ability to be in work around the critical times. Mothers without a working partner return to work more slowly following birth, but this can be explained by related differences in whether the mother was working prior to birth and work characteristics including the wage. The likelihood that a return to work following birth is permanent is greater for mothers with partners than for lone mothers, while those with a working partner are more likely to move into work over the period of school entry. There is limited evidence of lower wage growth following birth for mothers with partners, while mothers with partners are less likely to experience changes in other work characteristics over birth than lone mothers; the picture for the two groups is more mixed over the time of school entry. Mothers with higher-earning partners have longer absences following birth and are less likely to return to work over the period of school entry.

Mothers with lower levels of education return to work more slowly following birth, although this is partly explained by related differences in whether the mother was working prior to birth and work characteristics including the wage. Less educated mothers are also less likely to move into work when a child enters school. Non-white mothers return to work more slowly than white mothers following birth, but this is not explained by differences in work behaviour prior to birth. Non-white mothers are also less likely to move into work or remain in work when a child enters school.

The length of absence from work following birth is related to several pre-birth work characteristics. Those previously working longer hours or earning lower hourly wages have shorter absences, although both effects are relatively small. Industry and occupation are also important factors. Mothers who previously worked in the public sector have significantly shorter absences from work following birth than those who worked in the private sector. There is also some evidence that working part-time is correlated with lower wage growth: those working part-time prior to birth have lower wage growth following birth, while wage growth when a child enters school is lower for mothers who were working part-time prior to school entry.

9.2 Issues for policy discussion and further research

Although primarily aiming to be descriptive of the current situation rather than deriving specific policy recommendations, the analysis in this report has given rise to several findings that are relevant to policy discussion or are particularly worthy of further investigation given their potential policy relevance. These include the following:

- The theory that gender differences in the formal labour market stem from the division of parental duties between mothers and fathers in the home is supported by many of the findings. Policies aiming to enhance gender equality within the labour market are therefore best directed towards mothers and, in particular, to addressing why the effects of children appear to persist long after children have left home.
- The 'family gap' applies to a range of work characteristics beyond simple work participation and the wage, including hours of work, the permanency of work positions and supervisory levels. However, it has not been possible to discern whether the changes occurring around birth and school entry are desired responses by mothers to changing circumstances or whether they reflect a more general weakening in relative labour market position for women. Some of these movements in other characteristics are related to changes in wages and this begs the question of whether the changes are compensatory or whether declines in wages and movements towards poorer work conditions go hand-in-hand. This issue warrants further investigation.
- The findings on the effects of statutory maternity leave and pay are encouraging. Maternity leave and pay entitlements appear to be enabling some mothers to take the longer maternity leave they desire, while others find the maternity leave rights sufficiently beneficial to return to work earlier in order to benefit from them. In addition, mothers who return within their entitlement to maternity leave rights are less likely to experience changes in their work characteristics, particularly those moves that might be regarded as undesirable, such as working shorter hours, moving from a permanent to a temporary position or moving from a supervisory to a non-supervisory position. This indicates that maternity leave rights may indeed be helping women to maintain their position in the labour market following childbirth. But more data are needed to analyse fully the changes in maternity rights from April 2003.

- The analysis has highlighted how both the duration and **generosity** of maternity pay will determine its impact on the length of mothers' absence by determining how long mothers can afford to remain away from work. On the other hand, the length of maternity leave and the termination of its associated rights may constrain some women to return earlier than they would otherwise have done. In terms of future policy development, the evidence does not show whether maternity leave or maternity pay is the more influential on mothers' length of absence following birth. In reality, the influence of either is determined by how the two combine, given an individual woman's circumstances.
- Enhancing the ability of women to take longer absences from work following birth may have longer-term negative impacts on their labour market role. The evidence presented here does not support previous findings that longer absences are associated with lower future wage growth, but does suggest that the length of absence and receipt of maternity pay may affect changes in other work characteristics. In particular, women who are entitled to maternity pay are significantly more likely to experience a change in work characteristics than those not entitled, including some of the arguably less desirable changes in the permanency of position or supervisory level. The reasons for this are not clear and warrant further investigation.
- The evidence suggests that there may be a dynamic persistence in work participation between births in that mothers who return to work after their first birth are likely to return more quickly after subsequent births. To the extent that there is a genuine persistence, encouraging mothers to return to work between births could be an important factor in reducing the length of absence from work after subsequent births.
- The return to work following birth is not always permanent for mothers: even in the absence of a subsequent birth, mothers who have returned to work are much more likely to have subsequent spells out of work than fathers. Policy initiatives aiming to enhance the work participation of mothers need to focus not just on encouraging women to return to work following the birth, but also on ensuring that they remain in work.
- School entry for the last child in a family does not mark a sudden increase in mothers' participation in formal paid work. This suggests that the argument of some recent policy debate that mothers should be able to undertake formal paid work once their youngest child starts school may be misguided.
- Mothers with higher-earning partners have longer absences following birth and are less likely to return to work over the period of school entry, suggesting that the additional income from the partner may mean that mothers can afford to spend more time away from work. Although the average estimated effects are not large, they may have implications for policies that raise household income, particularly following a birth, such as maternity pay or tax credits.

- Mothers who previously worked in the public sector have significantly shorter absences from work following birth than those who worked in the private sector. If it is desirable to encourage mothers to return to work more quickly following birth, it would be insightful to investigate what particular traits of public sector employment entice mothers to return to work sooner and whether these features might be encouraged in the private sector where absent.
- Policies directed towards helping lone mothers return to, and remain in, work may be well targeted, as the absence of a partner seems to inhibit mothers' ability to be in work around the critical times: lone mothers return to work more slowly following birth, have a smaller likelihood that a return to work is permanent and are less likely to move into work over the period of school entry than mothers with partners.
- Non-white mothers have longer absences from work following childbirth than white mothers, even controlling for a wide range of differences across other demographic factors and prior work characteristics. This suggests that the source of the ethnic discrepancy must lie in other factors, such as differences in family or social support, differences in attachment to the labour force or ethnic discrimination in the labour market. Further investigation of this issue might be warranted, primarily to provide insight into the source of this and other ethnic gaps in the labour market, but also as a means to understanding more generally why some women, whatever ethnicity, are absent from work longer following birth.
- The use of nannies/mother's helps and childminders both increase when the first child enters school, indicating that nannies, mother's helps and childminders may be most useful to families with both school and pre-school children. However, the use of a single type of other formal childcare, most likely capturing care in school clubs and by au pairs, also increases with school entry. Although the proportion of families using this type of care more than doubles, its use remains relatively uncommon. This suggests that childminders, nannies and mother's helps may be more useful to working mothers when their children first start school than school clubs.
- Working mothers who only use childcare from within the immediate family or informal sources of care immediately prior to school entry are significantly less likely to be in work after school entry than those who use most other types of care. Discovering whether this is a causal relationship, or merely reflecting that different types of mothers have different preferences for and abilities to afford formal childcare, is a critical challenge for future research.
- There are few high-quality data-sets available to analyse the labour market behaviour of women before and after childbirth. Past studies that have sought to sample only women who have had a recent childbirth have had some deficiencies, either in the response rate or in the range of variables collected. This analysis has shown that household surveys that sample from the whole population can be used to analyse changes in labour market behaviour around

birth and school entry, but it would be desirable if such studies collected better information on entitlements to maternity pay and leave and also identified, retrospectively, periods of absence from work for maternity leave.

9.3 Are newborns and new schools critical times for mothers' employment?

The evidence is broadly consistent with the view that newborns and new schools are critical times in women's employment. While births, and particularly first births, clearly mark a dramatic change in participation in work for women, school entry is also a critical time of considerable turnover in participation, marking both the last years of unusually high rates of exit from work for women and the first years of unusually high rates of entry into formal paid work. The impact of these critical times on wages is more subtle: the gradual decline in women's relative wages appears to stem from the accumulation of several shorter periods of unusually low wage growth for women around the times of birth and school entry. Important changes in other work characteristics also occur around the critical times, particularly the sharp movement into part-time work following birth and the general transitions towards non-permanent positions and non-supervisory roles at both critical points.

The theory that gender differences in the formal labour market stem from the division of parental duties between mothers and fathers in the home is supported by many of the findings. In particular, there is a distinct point of divergence in men's and women's work behaviour when children are born and there is a very clear persistence of gender discrepancies following childbirth. However, the years prior to the arrival of children are also marked by some distinct gender differences, particularly in the wage and hours of work. The magnitudes of these differences are, however, of a much smaller order than those in the presence of children, suggesting that they either represent anticipatory effects of the impact of children or are driven by factors of much smaller relevance.

Appendix A
Sample statistics

Drawing comparisons across groups when different data sources contribute to the different groups is not problematic as long as the data sources are consistent in the variables considered. As the British Household Panel Survey (BHPS) alone contributes to the statistics for individuals who are not parents, it is important that the variables used are consistent between the two data sources, otherwise differences between the two data sources would appear as differences between parents and individuals without children. Tables A.1 and A.2 provide summary statistics for the demographic and work variables across the groups and between the BHPS and the Families and Children Study (FACS) for the parents.

Table A.1 Summary statistics

	Men				Women			
	Before or no children	Children present		Children left	Before or no children	Children present		Children left
Characteristic	BHPS	BHPS	FACS	BHPS	BHPS	BHPS	FACS	BHPS
Mean number of children	0	1.8	1.8	0	0	1.8	1.8	0
Mean age of youngest child	n/a	6.2	6.3	n/a	n/a	6.5	6.5	n/a
Mean age	28.9	37.8	39.0	45.3	28.6	35.6	36.2	48.3
Percentage with education level								
1. None	8.8	14.8	12.2	22.0	4.6	16.4	13.4	33.2
2. NVQ 1/<GCSE	6.4	8.3	8.7	6.9	6.4	11.8	9.6	9.5
3. NVQ 2/GCSE	18.9	18.9	27.4	17.9	20.2	26.5	33.3	21.3
4. NVQ 3/A level	22.4	12.9	16.3	12.0	23.4	10.5	13.7	6.7
5. NVQ 4, 5/high	43.0	44.3	26.2	40.8	44.9	34.0	18.7	28.4
6. Other	0.6	0.8	9.2	0.4	0.5	0.8	11.4	0.9

Continued

Table A.1 Continued

	Men				Women			
	Before or no children	Children present		Children left	Before or no children	Children present		Children left
Characteristic	BHPS	BHPS	FACS	BHPS	BHPS	BHPS	FACS	BHPS
Percentage with ethnicity								
White	95.3	95.7	83.1	97.9	95.9	95.1	92.7	96.3
Black	1.2	0.8	4.4	0.7	1.4	1.4	2.0	1.3
Other	3.5	3.5	12.5	1.4	2.7	3.6	5.3	2.5
Percentage with health problem	8.2	10.7	21.9	14.2	9.6	11.7	20.3	22.0
Percentage currently in work	81.1	87.8	90.9	84.4	81.9	62.4	65.4	73.6

The demographic data are generally consistent; in most inconsistent cases, the differences between the BHPS and the FACS can be traced to differences in the collection of the data which are not critical to their use in the analysis. The FACS has a higher proportion of individuals with 'other' education levels than the BHPS as the FACS reports were not so readily classified. The FACS also has a higher proportion of individuals with a health problem due to differences in the questions used to derive this variable: the BHPS used positive answers to either being registered disabled or 'health limiting type of work', while the FACS used a report of a 'long-standing illness or disability'.

Table A.2 Summary work statistics for those currently working

	Men				Women			
	Before or no children	Children present		Children left	Before or no children	Children present		Children left
Work characteristic	BHPS	BHPS	FACS	BHPS	BHPS	BHPS	FACS	BHPS
Mean weekly hours	43.2	47.3	43.8	47.2	38.4	27.3	27.0	32.6
Net weekly earnings	£263	£352	£383	£321	£225	£160	£199	£183
Hourly net wage	£6.24	£7.78	£8.80	£7.12	£5.83	£5.90	£7.44	£5.52
Gross weekly earnings	£355	£490	n/a	£444	£298	£202	n/a	£239
Hourly gross wage	£8.35	£10.78	n/a	£9.85	£7.62	£7.19	n/a	£7.03
Percentage in self-employment	11.2	18.1	14.9	19.3	5.1	8.1	7.3	9.0
Percentage in permanent position	88.9	94.7	96.0	95.1	89.2	90.7	91.9	94.4
Percentage in supervisory position	34.6	49.2	47.9	45.0	34.8	27.3	31.5	32.9

Continued

Table A.2 Continued

Work characteristic	Men				Women			
	Before or no children	Children present		Children left	Before or no children	Children present		Children left
	BHPS	BHPS	FACS	BHPS	BHPS	BHPS	FACS	BHPS
Mean firm size	303.8	297.6	244.2	291.2	301.4	246.0	221.1	247.3
Percentage work at home	3.6	6.8	9.4	7.7	1.7	6.0	7.0	5.7
Percentage in sector								
Private	81.8	79.2	n/a	79.8	67.8	58.5	n/a	56.9
Public	14.4	17.9		17.6	27.4	36.1		36.9
Other	3.8	2.9		2.6	4.9	5.5		6.2
Percentage work at time of day								
During day	71.3	68.4	n/a	68.4	73.5	57.7	n/a	62.1
Am or pm	2.3	1.5		1.8	2.7	14.5		13.7
Some eve/night	5.0	4.1		3.4	4.2	10.7		4.9
Varies	14.9	17.5		16.8	12.6	9.8		12.3
Other	6.5	8.7		9.6	7.1	7.3		7.1
Mean tenure in months	47.9	84.4	n/a	110.7	46.7	47.8	n/a	96.2

Turning to Table A.2, it should be noted that several of the work variables are only available in the BHPS and their analysis is restricted to the single data source. Again, the variables are broadly consistent across the two surveys with a few differences. The mean firm size may differ between the two data sources because they used different bands of size when collecting data, with the means calculated using the midpoint of these bands. The percentage working at home is higher for men in the FACS than in the BHPS because the FACS variable includes the choice of 'both at home and out to work' while the BHPS only offered 'at home' or 'business premises' or 'other'. Inconsistencies in the derived hourly wage variables, however, are not easily explained. While both data-sets collect normal weekly hours, the FACS only collects net earnings while the BHPS collects gross earnings for all workers and net earnings only for the employed and not self-employed. The average net weekly earnings figure (indexed to October 2003 prices) is higher for parents in the FACS than in the BHPS (nine per cent higher for fathers and 24 per cent higher for mothers). These substantial differences remain even when the FACS sample is restricted to the employed and the BHPS sample restricted to waves 9–13 to match the FACS period more closely. These differences between the data sources create a distorted picture of the gender wage gap across groups. In particular, the higher wage gap between mothers and fathers in the FACS than between mothers and fathers in the BHPS means that the gender wage gap is much lower for those with children relative to other groups when both data-sets are used. Consequently, the

analysis in the report uses only gross wages from the BHPS. In any case, it may be preferable to use gross rather than net wages in order to capture gender differences in market earning power rather than differences arising from tax policies.

Table A.3 Sample sizes for newborn sample by month after birth

Number of observations (Percentage of group)	First birth: Working prior	First birth: Not working prior	Subsequent birth: Working prior	Subsequent birth: Not working prior	All
All women					
First month after birth	1,503 (33.4)	531 (11.8)	1,140 (25.3)	1,332) (29.6)	4,506 (100.0)
Ninety-sixth month after birth	201 (29.1)	102 (14.8)	154 (22.3)	234 (33.9)	691 (100.0)
Women with a partner at birth					
First month after birth	1,291 (34.1)	388 (10.2)	1,056 (27.9)	1,056 (27.9)	3,791 (100.0)
Ninty-sixth month after birth	180 (29.1)	80 (12.9)	145 (23.4)	214 (34.6)	619 (100.0)
Lone mothers at birth					
First month after birth	317 (30.3)	196 (18.7)	135 (12.9)	399 (38.1)	1,047 (100.0)
Ninty-sixth month after birth	21 (29.2)	22 (30.6)	9 (23.4)	20 (34.6)	72 (100.0)

Note: The sum of the number of observations for women with a partner at birth and the number of observations for lone mothers at birth does not sum to the number for all women because the numbers for lone mothers include those in the FACS 'booster sample' who are excluded from the sample of all women.

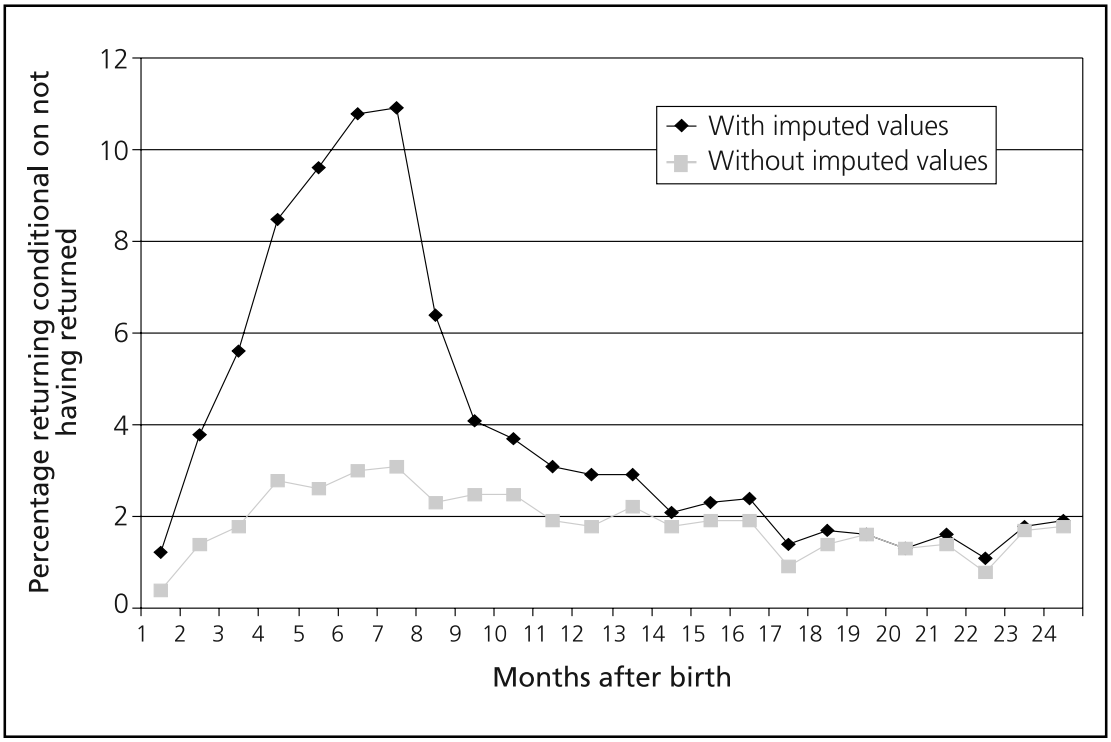
Finally, Table A.3 presents the sizes of the samples used in the calculation of the numbers for Figures 5.2 to 5.4. It should be noted that the number of observations is quite small by the ninty-sixth month after birth, particularly for lone mothers.

Appendix B
Imputed values for the length of maternity absence

For the sample of mothers with newborns, the return date to work could not be identified in some cases because mothers who have returned to working for their previous employer at the time of the interview following birth, are likely to report the start date for that spell of employment as the point when they first began working for that employer rather than the date they returned from maternity leave. Hence, there is a tendency for the maternity leave spell to be 'swallowed' into the longer employment spell. In addition, in a small number of cases, some return start dates for spells marking the return to employment following birth are simply missing or contradict the previous interview's report. In these cases, it is possible to generate an 'imputed' return date as the mean point between the earliest possible return date and the latest possible return date.

Some 38 per cent of the entire newborn sample is missing return dates for these reasons. The vast majority of these cases (85 per cent) are 'subsumed' spells of maternity leave, with the interval over which the return date is imputed beginning in the month after birth and ending within a year. Some of the others, where the start date of the return spell of work is missing at a subsequent interview, have much longer imputed return dates, the longest being 118 months.

Figure B.1 Monthly hazard rates for returning to work after birth



However, it is the density of imputed return dates close to the birth that makes their inclusion in the analysis so important. Figure B.1 illustrates this by presenting the estimated hazard rates with and without the imputed return dates for the first 24 months following birth. Without the imputed values, the higher hazard rates in the first 12 months would be omitted, reflecting the fact that many women who return quickly to work are back at work before the first interview, have returned to their previous employer and, in reporting their work histories, implicitly subsume these short absences into the longer spell of employment. The graph also highlights how this is more likely to be true for women with absences of less than eight months (where the gap between the two lines in Figure B.1 is greatest) because they are more likely to have returned before the first interview after birth and are more likely to have returned within the statutory maternity leave period and, hence, regard their absence as part of continued employment. Clearly, analysis without the imputed dates would not be an accurate representation of the true picture.

Appendix C
Maternity entitlements

This appendix describes the derivation of the variables for maternity entitlements, primarily used in Section 5.3, but also used in Tables 6.4 and 7.5. There are several important points to note in the derivation of these variables:

- Maternity rights are not directly reported in the data. The receipt of maternity pay can be identified in reports of different sources of household income, and women can report their main activity as 'on maternity leave', but the latter does not indicate whether they are on formal maternity leave in the legal sense or just taking an absence from employment following birth. Moreover, the latter variable is only reported at the time of the interview following the birth and maternity leave rights cannot be identified for those women who have already returned to work by this interview. Consequently, entitlements to maternity leave rights and pay are estimated on the basis of the woman's work history prior to birth.[77]
- The estimated maternity rights ignore any minimum earnings requirements.
- The estimates pertain only to statutory maternity leave but women may be entitled to more generous maternity arrangements provided by their individual employer.
- Legally, the maternity rights are defined in terms of weeks before or after the expected birth date but the derived estimates use monthly approximations. It is unlikely that work histories would have been reported substantially more accurately in weekly than in monthly terms, while differences between the actual and expected birth date would also complicate the accuracy of weekly measures.

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[77] A comparison of the estimated entitlements with entitlements reported via the receipt of maternity pay or via the main activity being 'on maternity leave' shows that they were not well matched, mainly due to no reported entitlement by women back at work and by a report of 'on maternity leave' for those who did not have the qualifying employment history.

- In cases where women are close to meeting qualifying conditions, the benefit of the doubt is given in favour of being eligible on the grounds that women are likely to ensure that they qualify if it only required a slight adjustment in their work.

Table C.1 presents an overview of maternity rights in place over the data period of September 1990 to December 2003. It should be noted that 'employed' refers to employment, whereas 'worked' can include either employment or self-employment. As can be clearly seen from the table, there have been many modifications to the rights over this period, mostly in terms of reducing the stringency of the qualifying conditions and increasing the length of entitlement following birth.[78]

Table C.1 Maternity leave and pay: September 1990 – December 2003

Entitlement	Approximate qualifying work conditions* (Birth month = month 0)	Entitlement (following birth)
(Ordinary) Maternity Leave (OML)**		
November 1994 – April 2000	Employed in month –3	14 weeks' unpaid leave
May 2000 – March 2003	Employed in month –3	18 weeks' unpaid leave
April 2003 – December 2003	Employed in month –3	26 weeks' unpaid leave
(Additional) Maternity Leave (AML)**		
September 1990 – April 2000	Continuously employed in months – 26 to –3	29 weeks' unpaid leave
May 2000 – March 2003	Continuously employed in months –14 to –3	29 weeks' unpaid leave
April 2003 – December 2003	Continuously employed in months –8 to –3	52 weeks' unpaid leave
Statutory Maternity Pay (SMP)		
September 1990 – March 1995	Continuously employed in months –9 to –4	12 weeks' paid leave ***
April 1995 – March 2003	Continuously employed in months –9 to –4	18 weeks' paid leave
April 2003 – December 2003	Continuously employed in months –9 to –4	26 weeks' paid leave

Continued

[78] There have also been considerable rises in the amounts of Statutory Maternity Pay (SMP) and MA.

Table C.1 Continued

Entitlement	Approximate Qualifying work conditions* (Birth month = month 0)	Entitlement (following birth)
Maternity Allowance (MA)		
September 1990 – March 1995	Worked any six months in months –15 to –4	12 weeks' paid leave ***
April 1995 – March 1998	Worked any six months in months –15 to –4	18 weeks' paid leave
April 1998 – July 2000	Worked any six months in months –19 to –4	18 weeks' paid leave
August 2000 – March 2003	Worked any six months in months –15 to 0	18 weeks' paid leave
April 2003 – December 2003	Worked any six months in months –15 to 0	26 weeks' paid leave

* Qualifying conditions also include minimum earnings for MA and SMP.

** The distinction between the two types of maternity leave was made clearer from May 2000 when they became 'Ordinary Maternity Leave' and 'Additional Maternity Leave'. (Ordinary) Maternity Leave was introduced in November 1994.

*** The entitlement was to 18 weeks' leave, but this had to start at least 6 weeks before the birth.

In estimating entitlements, it is useful to note the following points. The two types of maternity leave (AML and OML) are mutually exclusive: a woman eligible for AML is counted as not eligible for OML. The two types of maternity pay are also mutually exclusive: a woman eligible for SMP is, by law, not eligible for MA. From November 1994, most women eligible for SMP would also be eligible for OML, but this is not always the case. SMP requires the woman to have worked continuously for the same employer for 26 weeks before the qualifying week, where the qualifying week is 14–15 weeks prior to the expected week of birth, while qualification for OML requires the woman to be employed in the eleventh week prior to birth. Hence, a woman who leaves work between week 14 and week 11 prior to birth is eligible for SMP without OML (that is, in terms of Table C.1, if they were continuously employed in nine to four months prior to birth but were not employed in month three prior to birth). Finally, until April 2003, women eligible for AML were also eligible for SMP. From April 1993, women eligible for AML are also eligible for MA if they do not qualify for SMP. From April 1993, an individual not working in the ninth month before birth but working the following six months can be eligible for SMP but not be eligible for any leave entitlements.

Table C.2 Sample sizes for categories of maternity entitlements

	Entitlement sources		Number of observations		
Entitlement group	Period	Entitlements	All mothers	Mothers with partners	Lone mothers
(1) No entitlements	9/90 – 12/03	None	1,575	1,264	415
(2) Three to four months' unpaid leave	11/94 – 3/03	OML	17	13	6
(3) Three to four months' paid MA	9/90 – 3/03	MA	348	305	87
	11/94 – 3/03	MA + OML	63	52	17
(4) Three to four months' paid SMP	9/90 – 10/94	SMP	106	94	12
	11/94 – 3/03	SMP	29	22	14
	11/94 – 3/03	SMP + OML	257	216	73
(5) 3–4 months' paid SMP and six to seven months' unpaid leave	9/90 – 3/03	SMP + AML	1,474	1,345	182
(6) Six months' paid leave	4/03 – 12/03	SMP	4	2	2
		SMP + OML	1	1	0
		MA	34	28	6
		MA + OML	5	4	1
(7) Six months' paid leave and 12 months' unpaid leave	4/03 – 12/03	SMP + AML	161	142	19
		MA + AML	2	2	0
Total			4,076	3,490	834

Note: The number of observations in the final two columns do not sum to the number of observations for 'all mothers' because the column for lone mothers includes those in the FACS 'booster sample' who are excluded from the sample of all mothers. There were also three observations who qualified for six months' unpaid leave (OML after April 2003) who were omitted from the analysis.

In spite of the many changes in maternity rights, variation in the entitlement period is limited. Prior to April 2003, OML, SMP and MA all provided entitlements lasting three to four months, while AML entitlement lasted six to seven months following birth. From April 2003, OML, SMP and MA were all extended to six months and AML to 12 months. Categorising the data for newborns by these lengths of paid and unpaid entitlements generated the seven groups described in Table C.2.

The first group, 'no entitlements', contains the 39 per cent of mothers who did not qualify for either maternity leave or maternity pay. Many of this group included mothers with subsequent births who had not been working between births.

The second group contains a small number of mothers who only qualified for OML. The third and fourth groups contain those eligible for three to four months' paid leave, sometimes in conjunction with three to four months' unpaid leave. A distinction is made between SMP and MA eligibility because of the higher payment made under SMP during the first six weeks of paid leave. However, dividing these groups further by eligibility for OML as well as the two types of maternity payment generated much smaller sample sizes and, consequently, hazard graphs with too much 'noise' in the figures to identify meaningful patterns.

The fifth group contains the 36 per cent of the sample who are eligible for AML and SMP during the period prior to April 2003. The sixth group merges several very small subgroups together for the short period from April 2003, classified as six months' paid leave, although a few of these observations are also eligible for unpaid leave. The final group contains those from the period from April 2003 who qualify for the most generous rights of sixth months' paid leave and 12 months' unpaid leave.

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