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Postponement of Maternity  
and the Duration of Time  
Spent at Home after First  
Birth: Panel Data Analyses  
Comparing Germany, Great  
Britain, the Netherlands and  
Sweden

**Siv S. Gustafsson,**  
**Eiko Kenjoh,**  
**Cécile M. M. P. Wetzels**

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**POSTPONEMENT OF MATERNITY AND THE DURATION OF TIME SPENT AT HOME AFTER  
FIRST BIRTH: PANEL DATA ANALYSES COMPARING GERMANY, GREAT BRITAIN, THE  
NETHERLANDS AND SWEDEN**

Siv S. Gustafsson, Eiko Kenjoh and Cécile M.M.P. Wetzels

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## Summary

This paper analyses the postponement of first births of the 1990s compared to the 1980s, using panel data from four countries, namely, Germany (GSOEP), Great Britain (BHPS), the Netherlands (OSA) and Sweden (HUS). We find substantial postponement of maternity in all four countries for all educational groups with the most pronounced postponement among highly educated women in all four countries. However the mean age of the mother when giving birth to the first child remained the lowest in Great among the four countries in both decades.

Theoretically we can distinguish two motives for postponing maternity, namely, the consumption-smoothing motive and the career-planning motive. In this paper we concentrate on an important determinant of the maternal time costs: the time spent out of paid employment.

We make use of longitudinal information about the number of months elapsed since first birth until the mother is observed working in the labour market. We estimate parametric duration models with a Weibull distribution and obtain predicted months spent out of work since first birth.

We find that, given mothers' education level, for mothers who did not have a second birth within 36 months after first birth mothers in Britain entered the labour market more quickly after their first births in the 1990s compared to the 1980s. On the other hand, the German mothers stayed at home longer in the 1990s than in the 1980s. We do not find a significant change in the time period Dutch and Swedish first-time mothers spent at home after first birth between the 1980s and 1990s.

## Résumé

Ce papier analyse le recul des premières naissances de 1990 avec celles de 1980 en utilisant des panels de données de quatre pays, soit, l'Allemagne (GSOEP), la Grande Bretagne (BHPS), les Pays-Bas (OSA) et la Suède (HUS). Nous trouvons un recul important de la maternité dans ces quatre pays, pour tous les groupes d'éducation avec un recul prononcé parmi les femmes ayant suivi des hautes études. Toutefois, la moyenne d'âge de la mère à la naissance du premier enfant était le plus bas en Grande Bretagne, à la fois en 1980 et en 1990.

Théoriquement, on peut distinguer deux raisons de différer une maternité : le maintien du niveau de consommation et un plan de carrière. Dans cette étude, nous nous concentrerons sur un point déterminant les coûts engendrés par une maternité : le temps passé hors du marché de l'emploi.

Nous utilisons des informations longitudinales sur le nombre de mois écoulés entre la première naissance et le retour de la mère sur le marché de l'emploi. Nous estimons des modèles de durée paramétrique par la distribution de Weibull, pour obtenir une estimation du nombre de mois passés hors du travail depuis la première naissance.

Nous démontrerons que selon le niveau d'éducation de la mère, pour les mères n'ayant pas un deuxième enfant dans les 36 mois suivants le premier, d'un côté, les mères britanniques sont entrées sur le marché du travail plus rapidement après leur premier enfant en 1990 comparé à 1980. D'autre part, les Allemandes restaient plus longtemps chez elles après 1990 qu'en 1980. On ne trouve pas de changement significatif durant cette même période pour les mères néerlandaises et suédoises sur le temps passé chez elles après la première naissance.

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## POSTPONEMENT OF MATERNITY AND THE DURATION OF TIME SPENT AT HOME AFTER FIRST BIRTH

### PANEL DATA ANALYSES COMPARING GERMANY, GREAT BRITAIN, THE NETHERLANDS AND SWEDEN<sup>1</sup>

#### 1. Introduction

In most European countries age of the mother at first birth has increased to an all-time high. The share of women who never give birth to a child, the ultimate childlessness rate, has increased to the highest level since the Second World War. In a series of articles (Gustafsson & Wetzels 1997; Wetzels 1999, chapter 7; Gustafsson & Wetzels 2000; Gustafsson 2000) we have claimed that economic rationality works in favor of postponement of births, while biological rationality presumably calls for a halt to the postponement trend and perhaps a reversal. In the economic theoretical literature two main explanations for postponing births have been given: the consumption smoothing motive and the woman's career planning motive. The consumption-smoothing motive implies that children should be had at a point of time when household income is the highest so that other consumption needs can also be fitted into the budget. For the consumption smoothing motive, therefore, husband's income profile matters and since income profiles are typically increasing with age, rationality calls for postponement of parenthood. Generally the career-planning motive also calls for a postponement of birth. The extent to which postponement occurs depends on several determinants (Gustafsson 2001) such as: the rate of depreciation of human capital due to nonuse; the amount of pre-marriage human capital; the rate of return to human capital investments; the profile of human capital investment and the length of time spent out of the labour force.

This paper is in two parts. First, we analyze age at first birth for births occurring in the 1980s and in the 1990s. Second, we analyze the survival rates of being a full-time homemaker after first birth for women who had their first birth in the 1980s in comparison with in the 1990s. We make use of longitudinal information about number of months elapsed since first birth until the mother is observed working in the labour market in four countries: Germany, Britain, the Netherlands, and Sweden. In previous work (Gustafsson, Wetzels, Vlasblom and Dex 1996) we focused on labour force transitions around childbirth. In this paper by adding more recent waves of the household panels in our four countries, we get longer panels and we are able to distinguish between births that occurred in the 1980s and births that occurred in the 1990s.

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1 . Professor Siv S. Gustafsson is attached to the Department of Economics of the University of Amsterdam; Cécile M.M.P. Wetzels is attached to the TNO Institute of Strategy, Technology and Policy, and Eiko Kenjoh is at the Department of Economics of University of Amsterdam. **Previous versions of this paper were presented at conferences in Brussels (International Conference, Women in Economics and Decision Making Process, February 8, 2000), Bonn (The 14th Annual Conference of the European Society for Population Economics, June 14-16, 2000), and Köln (The 5th International Conference on Social Science Methodology, October 3-6, 2000).**

All our four countries have some kind of legislation and subsidizing of costs of children. Kindergartens, day care centers, child allowances, job protection during maternity and parental leaves, income compensation during parental leave are examples of such legislation, which all have the effect of decreasing the costs of children for the parents. Regulations of such family policies are typically shaped by ideologies in the different countries and have different effects on the time spent out of market work to care for children. In Germany, for example, the job protection period has been increased in steps from 6 months to 36 months from the mid 1980s to the early 1990s. Such an increase is likely to have an impact on the time future mothers plan to stay out of work. However, it is not certain that the ultimate impact of increasing the job protection period will be negative for women's labour force participation. It may be also the case that in a regime of a short job protection periods more women drop out of the labour market for good, because they fail to find new jobs after having spent time in full-time caring at home which exceeds the job protection period. Work of Rösen and Sundström (1996) shows that Swedish and Norwegian women have returned on average earlier to the job market when the parental leave period has been extended, gradually in the 1970s and 1980s reaching between 12 and 18 months by the end of the 1980s in both countries.

The outline of the rest of this paper is as follows. Section 2 describes the trends of postponement of maternity in Europe and looks at the postponement of maternity in our 4 countries based on the household panel data. Section 3 contains a discussion about economic reasons for postponing births. Section 4 reviews policies, which have an impact on the mothers' time spent out of the labour force after giving birth to the first child in the four countries.

Section 5 presents the Kaplan-Meier estimates of the probability of staying at home after childbirth, comparing in the 1980s and 1990s. Section 6 is a parametric survival analysis of the mothers' time spent out of paid work and an analysis of the differences between women who gave birth between in the 1980s and those who gave birth in the 1990s in our four countries. Section 7 concludes.

## **2. Postponement of Maternity in the 1990s<sup>2</sup>**

Postponement of maternity has not yet received the attention it deserves by economists. There is more demographic than economic research. Bosveld (1996), Beets (1997; 1998) provide interesting demographic research on the aging of maternity in Europe. Economic research has so far only to a limited extent focused on the aging of maternity. For example, in the recent Handbook of Population and Family Economics, Hotz, Klerman and Willis (1997) devote only one and a half pages to the timing of births.

The purpose of this paper is to analyze what economic explanations can contribute in explaining the increasing age of the mother at first birth. In Table 1, the mean age of the mother at first birth for selected countries is presented. We observe in Table 1 that there is a U-shaped pattern over time with the bottom in 1970 or 1975, i.e. the lowest age of the mother at giving birth to her first child occurs in all these countries around 1970 or 1975. Age of the mother at first birth first decreased from those births that occurred in 1950 to the lowest level around 1970 and then it increased again to the highest level observed in the data in our latest year of observation. For example, in 1950 in the Netherlands mothers' age at their first birth averaged 26.5 years, in 1970 it had decreased to 24.7 years, in 1991 it had increased to 27.7 and in 1997 the mean age of the mother at first birth was as high as 29 years old. There are also clear differences between countries with East European countries having the youngest mothers.

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2. By postponement, we mean the increase in the mean age of the mother at giving birth to a first child in one period compared to another period, i.e. 1990s compared to the 1980s.

**Table 1. Mean Age of the Mother at First Birth, Selected Countries, 1950-1997**

Country	1950	1955	1960	1965	1970	1975	1980	1985	1990	1991	1997
Belgium	25.2	24.9	24.6	24.4	24.4	24.8	25.6			27.0 <sup>a</sup>	
France	24.7	24.3	24.4	24.1	24.0	24.1	24.6	25.5			28.1 <sup>b</sup>
Netherlands	26.5	26.1	25.7	25.1	24.7	25.2	25.7	26.6	27.6	27.7	29.0
West Germany*			24.9	24.2	23.8	24.4	25.0	25.9	26.3	25.9	28.4 <sup>c</sup>
East Germany*		23.6	23.0	22.7	22.5	22.5	22.3	22.3			27.3 <sup>c</sup>
Norway							24.3	24.9	25.6	25.8	27.0
Sweden						24.4	25.3	26.1	26.3	26.5	27.3 <sup>b</sup>
England-Wales	24.6	24.3	24.0	23.6	23.2	23.6	24.2	24.6	25.0	25.1	26.7 <sup>c</sup>
Denmark					23.8	23.9	24.6	25.7	26.4	26.8	27.7 <sup>c</sup>
Finland								25.4	26.5	26.6	27.7
Iceland						21.8	21.7	22.8	23.9	24.3	25.0
Ireland						25.0	25.0	25.6	26.2	26.3	27.0
Italy		25.3	25.3	24.9	24.6	24.2	24.6	25.4	26.4		27.5 <sup>a</sup>
Portugal	25.6	25.6	25.5	25.3	25.0	24.4	24.0	24.2	24.9	25.1	25.8 <sup>c</sup>
Spain						25.1	25.0	25.8	26.8	27.1	27.7 <sup>b</sup>
Hungary		23.4	22.9	22.9	22.8	22.5	22.5	22.9			23.4
Czech Republic*		23.2	22.8	22.7	22.5	22.6	22.5	22.5			24.1

Countries with border changes around 1990.

Figures for 1997 or latest year available the source is Council of Europe (1998).

The following are for a different year than 1997:

a) 1993

b) 1995

c) 1996

Source: Willy Bosveld kindly supplied the figures until 1992, which are the sources for her dissertation, Bosveld (1996).

Beets (1997) presents the age of the mother at first birth according to birth cohort of the mother and in addition to the median age reports figures for the first and third quartiles. The age of the mother at first birth when 75 per cent of women have had a first birth has increased spectacularly comparing the cohort of women born in 1945 to that of women born in 1955. Among the 15 European countries analyzed by Beets (1997), the third quartile is older than age 30 for seven countries: Ireland, the Netherlands, Sweden, Denmark, England and Wales, Finland and West Germany. For West Germany the third quartile for women born in 1955 is as high as 34 years. This means that 25 per cent of women of this cohort have not given birth to their first child by age 34. However, about 23 per cent of these women will never give birth to a child (Bosveld 1996; Gustafsson 2001). Beets (1998) presents figures split according to the education of the mother for a number of countries and also figures for the proportion of women still childless at age 35 according to education. Among high-educated Dutch women born between 1948 and 1953 as many as 43.2 per cent were still childless at age 35 and for the cohort born between 1953 and 1957 the proportion is 37.0 per cent. Other countries that come close are: Italy (33.0), Spain (35.3) and Canada (37.6).

In Table 2, we have computed cumulative proportions of mothers according to age at first birth, education and whether the baby was born in the 1980s or in the 1990s, from the four household panel data sets, GSOEP (Sample A, i.e. Germans in West Germany) for Germany 1984-1996 (Wagner et al., 1991; Haisken-De New and Frick, 1998), BHPS for Great Britain 1991-1997 with retrospective data from 1980 (Taylor, 1992; Halpin, 1997), OSA for the Netherlands 1985-1996 with retrospective data from 1980



(Allaart et al, 1987) and HUS 1984-1998 for Sweden (Klevmarcken and Olovsson, 1993).<sup>3</sup> How birth data have been achieved from the panel data is described in Wetzels (1999, chapter 2). The general pattern from Table 1 is confirmed in Table 2. Table 2 shows a substantial postponement of childbearing comparing births that occurred in the 1990s to births that occurred in the 1980s in all four countries, although the mean age of the woman at giving birth was the lowest in Great Britain both in the 1980s and in the 1990s. In Table 2 the denominator is women who gave birth to a first child, so that different from the figures cited from Beets (1997) above ultimate childlessness is not included. First of all, we notice in Table 2 that higher educated women have their first child at a substantially later age than women with less education. At age 27 in Germany, for example, the proportions of high-educated women, who had given birth to their first child was 27.3 per cent in the 1980s whereas among low educated women the corresponding proportion was 72.9 per cent. Corresponding figures for the 1990s was 10.3 per cent for high-educated women and 64.0 per cent for low educated women.

This pattern of later births for women with higher education is a pattern that occurs in all four countries. However, there are clear differences between the four countries. Looking at the last two columns of Table 2, we find that the ranking between countries as it comes to the youngest mothers, i.e. those who were mothers at age 23 is the fewest in the Netherlands followed by Germany, Sweden and Great Britain. The ranking between the four countries is the same in the 1980s as in the 1990s as it comes to the proportion having had their first child by age 23. Also the proportion of mothers having had their first child by age 27 in the 1990s is the smallest in the Netherlands followed by Germany, Sweden and Great Britain, only the difference between the Netherlands and Germany has increased in the 1990s. At age 31, again looking at the total across educational groups, we find that Netherlands, Germany and Great Britain are almost equal for births occurring in the 1980s about 90 per cent having taken place by the time the mother was 31 years old and between 80 and 85 per cent for births occurring in the 1990s. Sweden has the largest proportion of births occurring to mothers who are older than 31 years, namely in the 1990s as many as 24 per cent. Finally, the proportion of first time mothers who were older than 35 years has increased in all four countries and in the 1990s it was 4.9 per cent for Germany, 5.6 per cent for Great Britain, 4.8 per cent for the Netherlands, and 9.1 per cent for Sweden.

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3. GSOEP = German Socio Economic Panel, BHPS = British Household Panel Survey, OSA = Organisatie voor Strategisch Arbeidsmarktonderzoek, HUS = HUShållens ekonomiska levnadsförhållanden.

**Table 2. Cumulative Proportion of Mothers According to Age at First Birth, Education and Time Period**

Education	1980s			1990s			1980s	1990s	
	High	Medium	Low	High	Medium	Low	All	All	
<b>Germany</b>									
	23	6.1	12.5	39.0	0.0	8.1	23.7	29.3	17.4
	27	27.3	53.6	72.9	10.3	38.7	64.0	63.2	52.0
	31	78.8	87.5	92.1	59.0	90.3	87.2	89.5	84.2
	35	100.0	92.9	96.1	92.3	96.8	95.1	95.9	95.1
Mean		29.3	27.8	25.3	30.8	28.5	26.7	26.3	27.6
Std. Dev.		2.99	4.48	4.49	3.12	3.39	4.56	4.57	4.41
N		33	56	177	39	62	203	266	304
<b>Great Britain</b>									
	23	16.4	32.4	51.3	13.2	22.9	44.8	42.8	31.8
	27	45.3	73.0	78.0	40.3	52.9	66.8	71.8	56.6
	31	76.7	89.2	91.7	71.7	82.8	83.6	89.3	79.9
	35	93.8	96.4	97.9	94.3	95.4	94.1	97.0	94.4
Mean		28.1	25.6	24.1	28.7	27.1	25.3	25.0	26.6
Std. Dev.		4.53	4.65	4.74	4.72	4.84	5.93	4.92	5.62
N		128	111	528	159	87	286	767	532
<b>The Netherlands</b>									
	23	3.8	21.9	30.8	5.6	6.1	25.4	24.4	12.9
	27	22.6	68.2	70.6	22.2	46.9	53.5	63.7	45.0
	31	83.0	92.7	92.5	69.4	82.6	85.9	90.7	81.3
	35	98.1	99.3	92.9	86.1	96.9	98.6	98.7	95.2
Mean		29.1	26.1	25.6	30.1	28.2	26.8	26.3	28.1
Std. Dev.		2.83	3.43	4.21	3.73	3.55	3.94	3.89	3.91
N		53	151	146	36	98	71	350	205
<b>Sweden</b>									
	23	13.3	35.7	42.7	7.7	20.8	27.5	33.9	19.6
	27	42.2	69.1	75.0	24.6	66.0	69.2	65.6	54.6
	31	77.8	90.5	88.5	58.5	81.1	85.7	86.3	76.1
	35	100.0	95.2	94.8	84.6	96.2	92.3	96.2	90.9
Mean		28.2	25.6	25.1	30.5	26.9	26.6	26.0	27.9
Std. Dev.		3.87	4.32	4.95	4.94	4.79	5.36	4.72	5.35
N		45	42	96	65	53	91	183	209

Own calculations based on GSOEP 1984-1996, BHPS 1991-1997 (retrospective 1980-1991), OSA 1985-1996 (retrospective 1980-1985) and HUS 1984-1998. Education: high: 15 years and more; medium: 12 years and more and less than 15 years; low: less than 12 years of education. Sample A (West Germany, Germans) is used for Germany.

### 3. Theoretical considerations on optimal age of maternity

In this paper we are interested in the planning problem of young women: when is the right time to give first birth and what are the determinants for the duration of home time after the first birth, considering life time earnings?

Hotz, Klerman and Willis (1997) review theoretical literature on the timing of first birth. They remark that what determines optimal age at which to begin childbearing in models reviewed hinges on (1) what one assumes about how parents value their offspring (2) the structure of capital markets and (3) how maternal time costs vary over the life cycle. If one assumes that a child always gives a positive value to its parents this is a reason for early births, since the parents can then enjoy the child a larger number of years. Assuming that adult children and grandchildren also increase utility of parents strengthens the arguments for early births. The structure of the capital market is important in the decision of timing of birth because the lifetime earnings loss is a result of human capital investments never carried out due to insufficient opportunities of combining work and family. If a young couple could borrow against future incomes to finance the caring costs, births could be had earlier. A perfect capital market would allow this. However this option is usually not available and it is therefore more correct to characterize the capital market as 'perfectly imperfect' using the expression of Hotz, Klerman and Willis (1997). In reality, however, some costs can be financed against future earnings, like is the case with student loans, and housing mortgages.

In this paper we focus on the third element of the three factors mentioned by Hotz, Klerman and Willis (1997) namely on the maternal time costs. The crucial determinants of maternal time costs are time spent out of market work and forgone human capital investments. If the time period spent out of work after giving birth is longer, then the direct time costs will be also larger. In the extreme case if the woman will spend all her life after being a mother in full-time home making she will maximize her lifetime earnings by deferring motherhood to the biological limit. However, lifetime earnings may be increased by postponing birth also if a period of full-time home caring is followed by a return to gainful employment. Whether this is the case, will depend on the comparison of the sum of the direct wage loss during the period of home time and the indirect wage loss caused by possible decline in wage growth after return to work, theoretically for a woman who has a first birth at different ages. There is empirical evidence for a downward shift in wages caused by time spent at home. Mincer and Polacheck (1974) showed such a negative effect of home time on subsequent earnings for the United States. Gustafsson (1981) showed similar results on basis of Swedish wage data.

In our empirical analysis we focus on women's time spent out of market work after giving birth to the first child. The time cost is by no means delimited to a period right after birth but includes also periods of part time work during a number of years while the children are small. However, our unit of analysis is the duration of time spent at home after giving birth to the first child making use of detailed, monthly information on the labour force status of the mother in our datasets.

It is our view that the postponement of maternity in Europe described in section 2 is caused by increasing proportions of women in Europe, who have concerns about the combination of work and family. Therefore, in addition to women's own human capital considerations, social policies will influence the feasibility of the combination of work and family after the first child is born.

### 4. Parental Leave and Related Public Policies

We believe that a rational woman makes an estimate of when in her career it is most feasible to have a child and how many months she would like to be full-time at home with her newborn baby and when she plans to return to work and if so whether she would like to work part time or full-time. These

choices depend partly on her opportunities to find affordable good quality day-care for her child, partly on how much she would earn on her job if at work net of commuting time and work costs and partly on her preferences for a housewife role as against a combined career and mother role. The outcome of these choices depends, to a large extent, on the institutional and cultural setting with which she is confronted. Public policies can create different economic incentives for this choice.

In this section, we review policies, which have an impact on the time period a recent mother will stay at home from work to care for her newborn child. These policies are very different between our four countries. The view on the proper role of mothers differs historically between clusters of welfare states according to the typology of Esping-Andersen (1990) and can be aggregated into the liberal welfare state, the conservative Christian democrat welfare state and the social democrat welfare state respectively. In addition to this welfare state typology countries differ in the degree of conforming to the idea of different roles for men and women with men as breadwinners and women as care providers (Pott-Buter 1993; Gustafsson 1994; Sainsbury 1996). In the liberal welfare state it is left to the parents themselves to find day care and finance the earnings loss of home time to care for children of the 4 countries. Great Britain has the fewest publicly funded provisions for combining work and family. In the conservative Christian democrat welfare state policies are organized in order to induce women to work in the home caring full-time for young children. Among our four countries Germany is close to this model.<sup>4</sup> However, new legislation is becoming effective in Germany from births occurring in 2001. This new legislation recognizes the wish of young fathers and mothers to share work and caring tasks by allowing part time work and care simultaneously for each parent<sup>5</sup>.

The German legislation during our observation period gives the right to DM 600 per month, which becomes household income tested from the 7th month till 2 years after the child is born. This implies that highly educated women with higher earnings before childbirth lose more of their earnings than low-educated and less-earnings women. Moreover, a high-earnings husband decreases the probability of receiving DM 600 from the 7th month till 2 years. The German period of job protection has been extended from the mid 1980s in steps from 6 months to 36 months in 1993 (Wetzels 1999, chapter 2). In recent years an influx of women from Eastern Europe and elsewhere into Germany supply domestic services which is another source for German women to find affordable good quality daycare for children.

In Sweden, since the 1970s, a number of policy measures have been introduced in order for women to combine work and family. Parents are entitled to earnings compensation for a maximum of 12 full-time months. These 12 full-time months can be distributed between father and mother as they please and several changes on the distribution can be made, such as mother full-time at home, father full-time at home, each part-time or one parent part-time combined with purchased day care. The Swedish job protection period expires when the child is 18 months. There is therefore a gap between the job protection

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4. Our policies refer to West Germany from 1984 till 1989. Thereafter the policies refer to re-united Germany.

5. We thank Heike Trappe, Max Planck Institut für Bildungsforschung, Berlin for making us aware of German parental leave policies to be effective from 2001 (see <http://www.bmfsfg.de>). Most importantly, parents can receive of childrearing payments while simultaneously shortening their working hours to 30 hours per week until the child is 3 years old (some States extend these payments for a third year). Benefit payments are income tested: households with incomes below DM 100 000 (DM 75 000 for single parent families) receive a flat-rate benefit worth DM 600 per month for the first 6 months. From the 7th month onwards couples with an annual income below DM 32 200 (below DM 26 400 for a single parent family) continue to be paid DM 600 per month while payment rates are reduced to zero across the DM 32 220 to DM 100 000 income range. Alternatively, parents can choose to receive childrearing benefit for one year only, receiving payments worth DM 900 per month. Parental leave can be taken in different spells up to child is 8 years of age.

period and the compensation period, if the mother chooses to be full-time at home. Also in order to induce fathers to take part in the parental leave, one of the 12 months is the father's month with 90% of his salary compensated and one month is the mother's month with 90% of her salary compensated. Other months are compensated by 75 per cent of earnings of the parent who stays home caring for the child. When the child is 18 months old, as one of the parents is allowed to work six hours to be in day care for 5 days per week at reduced hours day until the child is 8 years old (see, Gustafsson 1984, 1994; Wetzels 1999, chapter 2; Sundström 1996).

In the 1980s the Netherlands had a family regime that looked very much like the German system, dominated by the idea that mothers of small children are full-time homemakers. From about 1990, policies in the Netherlands have changed into including measures to facilitate the combination of work and family. The underlying policy model is different from the Swedish one in the emphasis on sharing between employer, parents and government. For example, in the Netherlands the division of costs in the formal childcare sector is 42 per cent paid by central government, 33 per cent by households and 25 per cent by firms (see, Dobbelsteen, Gustafsson and Wetzels 2000). In Sweden, on the other hand, the parental contribution averaged 15 per cent in 1994 and the remainder of the costs is shared between the central government and the around 280 local governments of the communities, which, different from other countries, have to raise their own tax money and also run and provide the childcare services. In the Netherlands, the majority of childcare centers are run by private entrepreneurs and the respective spaces are bought by either the local governments of the communities, or the firms who supply daycare to their employees, or directly by those parents who have no access to community subsidized childcare nor to employer subsidized childcare. The employer is totally absent in Swedish policies, whereas in the Netherlands a substantial number of daycare spaces are supplied by the employer of the parents. Also leave for caring for young children in the Netherlands are on a part-time basis; at maximum half of the usual working week for a 6 months period. The financing of the parents' income loss during the leave period differs between collective bargaining areas of which there are about 800 in the Netherlands. Eligible public sector workers often receive 75% of earning during the parental leave period.<sup>6</sup> The Dutch policies are much less generous to parents than the Swedish policies but they are also much less demanding on public budgets. Some of the policy measures are summarized in Table 3.

The conclusion of this policy review is that the Dutch policy maker imagines a full-time home period of not more than 14 to 16 weeks of which 6 weeks must be taken before childbirth and is followed by part-time work by both parents for half a year. After that the Dutch policy maker probably envisions part-time work by the mother indefinitely since part-time work is promoted as a good solution to the combination of work and care and Dutch employers have found part-time workers one of the solutions to the increasing demands of a flexible work force. The Swedish policy maker envisages a 18 months period of full-time home care shared by parents -- in practice usually the mother, followed by a return to a 30 hours working week until the child is 8 years old, to return to full-time work afterwards. The Swedish minister of labour recently said: 'Everyone should work full-time'.

The German view would be that mothers are full-time at home until the child is 3 years old, but the home care caring period may extend beyond this period since there is almost no full-time day care, although an extensive kindergarten system is in place which enrolls most children from 3-6 years old (see footnote 5 on recent reform of parental leave policies in Germany). The school day is also not organised to accommodate a working mother's needs. There are no special provisions for part-time work and secondary earners who work part-time are penalised by 'income splitting in the tax system', which effectively taxes secondary earnings usually female earnings, at the spousal marginal tax rate (Gustafsson 1992), except when workers are involved in so-called "marginal employment" in Germany: i.e. when the regular working

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6 . The leave period can be extended to a year if a smaller portion than half time is used for parental leave, while the maximum leave period remains half time half a year.

week is less than 15 hours subject to an upper annual earnings limit. Until 1 April 1999, such earnings were not subject to social security contributions (Hoffman and Walwei 1999). This marginal part-time employment is more likely to be registered by the GSOEP, which we are using in this paper, than by the German Labour Force Survey. The number of marginally employed people are estimated to be 5.4 million by the GSOEP, 5.6 million by another survey the ISG and only 2.2 million by the Labour Force Survey for 1996 (Hoffman and Walwei, 1999).

Until the late 1990s, British policies involved limited support to parents in terms of paid parental leave and public childcare support. New policy initiatives have been announced by the Blair government, but it is too early to assess whether these initiatives will improve the opportunities of women to combine work and family life.

**Table 3. Type of Welfare State and Family Policy Regime**

<b>Welfare state typology</b>	<b>Liberal</b>	<b>Conservative, Christian Democrat</b>		<b>Social Democrat</b>	
Welfare state characteristic	Only if market fails the state will intervene.	Only if family's capacity to service its members is exhausted, the state will intervene.		Welfare provisions are institutional, and usually apply to all citizens alike	
<b>Country</b>	<b>United Kingdom</b>	<b>Netherlands</b>		<b>West-Germany</b>	<b>Sweden</b>
Policy focus on	- economic need - children's education	till 1990s - econ. need - children's education	from 1990s - childcare - women's labour force participation - equal sharing paid and unpaid work between men and women	- allowances - family income - child benefits	- childcare - women's labour force particip. - equality between men and women
<b>Maternity and parental leave</b>					
Women's total job protection period <sup>1</sup>	medium	short	Medium	long	long
Income compensation during total job protection	small	large	only in public sector large	small	large
Parental leave paid by <sup>2</sup>	employer	employer	Employer	tax money	tax money
Interruptions allowed			no, one period		yes, "banking system" <sup>3</sup>
<b>Childcare</b>					
Subsidised full day child care	No	no	Yes	no	yes
% of cost paid by parents <sup>4</sup>	n.a.	n.a.	28	n.a.	13.4
% of children of ages 0-3 in formal childcare <sup>5</sup>	2	n.a.	7.5	3	27 (50)
Child's school starting age	5	4	4	6	7

Lfp = labour force participation; <sup>1</sup> total job protection means protection during pregnancy and parental leave; <sup>2</sup> pregnancy benefits are paid out of tax money in UK, Germany and the Netherlands but maternity leave benefits are paid by the employer. In Sweden no distinction is made between pregnancy and parental leave.; <sup>3</sup> Sundström (1996); <sup>4</sup> estimates by CBS (1991), statistics Sweden for 1994; <sup>5</sup> SCP 1997: 124 for children 0-7 before school start the figure is 50% for Sweden, figure for the Netherlands: Mutsaers (1997)

## 5. Mother's time spent at home after first childbirth

We hypothesized in section 3 that there might be a connection between postponement of maternity and time spent out of market work for care tasks. Section 4 we demonstrated that public policies in our four countries differ with respect of the feasibility of combining work and family. Our hypothesis is that in countries with fewer provisions such as day-care and paid parental leave, the time spent at home would tend to be longer, other things equal. In this section we compare the duration of home time after the date of birth of the first child for our four countries. The data have been reorganized into birth and work history files by using all surveys and all retrospective information between surveys on the variables of interest. In previous work (Gustafsson, Wetzels, Vlasblom and Dex, 1996), we used the first transition into paid work to characterize work behavior irrespective of the length of the work spell. By inspecting the data, we find that recent mothers make many moves into and out of market work. In this paper, because we

aim at capturing behaviour which is of certain stability, we decided to count as transitions into work only those moves that were followed by a work spell of at least six months.

In order to look at the difference in behaviour of women who had their first births in the 1980s and those who had their first births in the 1990s, we present in Table 4 the Kaplan-Meier estimates of survival rates of a woman staying at home by month since first birth<sup>7</sup>. One aspect of emancipation of women is increased opportunities to combine work and family. Therefore if this wish of women were realized to a larger extent over time we would expect smaller rates of full-time housewives in the 1990s than in the 1980s. The figures of Table 4 do not confirm this expectation. German women remain in the home to a much larger extent in the 1990s than in the 1980s, thus indicating that being a housewife has become rather more frequent over time than less frequent after giving birth to the first child. Whereas by the time the child is five years old 69 per cent of 1980s mothers had taken up paid work, 53 per cent had done so if their child was born in the 1990s.

**Table 4. Kaplan-Meier Estimates of the Probability of Not Entering the Labour Market since First Birth, by Months**

	1980s				1990s			
	Germany	Great Britain	Netherlands	Sweden	Germany	Great Britain	Netherlands	Sweden
3 months	90.9	86.7	51.9	75.6	96.8	76.5	60.5	77.5
6 months	88.6	79.3	50.1	73.1	92.7	66.2	51.5	77.6
9 months	79.3	73.2	48.5	73.1	88.7	59.0	48.5	75.7
12 months	70.8	70.0	48.2	66.7	84.2	56.4	45.9	73.8
15 months	62.2	66.9	46.5	60.1	82.0	52.5	44.6	64.1
18 months	58.2	64.1	46.5	47.1	73.3	50.4	43.9	56.8
24 months	52.2	59.9	45.9	39.2	64.4	44.0	43.2	39.9
30 months	48.9	56.8	44.4	32.3	60.5	41.1	42.3	33.4
36 months	46.1	53.9	41.8	26.6	56.3	39.0	40.2	25.6
42 months	42.7	51.4	40.6	23.8	51.5	35.3	39.0	21.7
48 months	38.8	48.3	39.4	17.8	50.4	32.3	39.0	19.0
54 months	34.6	46.1	39.0	11.9	49.1	31.2	37.1	15.2
60 months	30.7	44.6	37.1	8.9	46.9	29.9	37.1	15.2
N	263	724	333	78	285	512	208	125

Germany: GSOEP 1984-1996, Great Britain: BHPS 1991-1997 and retrospective 1980-1991, The Netherlands: OSA 1985-1996 and retrospective 1980-1985, Sweden: HUS 1984-1998. All available waves are used for all four household panel data sets. Restricted to counting observations of entering into paid work only if the women remains in paid work for at least 6 consecutive months after bearing made the transitions. Sample A (West Germany, Germans) is used for Germany. Self-employers are excluded from our sample for Great Britain.

In Great Britain mothers are indeed more likely to have left the housewife status earlier after having given birth if the child was born in the 1990s than in the 1980s. In the Netherlands, as described above, there has been a distinctive policy shift moving from the housewife ideology into welcoming the combination of work and family. Therefore we had expected a move into more market work of mothers.

7. By the nature of these data the number of months after birth that a woman is observed differs between women depending on the year she gave birth, since everyone is observed during the same calendar years. This means that the survival rate of home time after birth in for instance the 60th month is based on a small number of observations, particularly in our data for births occurring in the 1990s.

What we see in Table 4 is a rather stable pattern across the two decades with the smallest number of full-time housewives before the baby is 18 months old in comparison to the other three countries. This is to be expected because of the Dutch part-time policy described above which allows both parents of a newborn to be half time workers until the child is one year old.

The pattern of survival rates of home time in Sweden is in accordance with expectations from public policies. We would expect most mothers to be full-time housewives until the child is 12 months old because until 1986 the parental leave benefit was 90 per cent of previous earnings. In the 1990s the job protection period expires when the child is 18 months and most mothers would be expected to return to work by then. More mothers in the 1990s stayed at home until their children were 18 months than the 1980s mothers did. We also find that by the time the child is five years old less than 9 per cent of Swedish 1980s mothers are housewives and 15 per cent of 1990s mothers, this is the smallest proportion comparing across countries.

## 6. Parametric duration analysis of time spent at home

We use a parametric duration model with the Weibull distribution to estimate mothers' time spent at home after first birth since giving birth to the first child (for duration analysis, see Kiefer 1988; Greene 1997, pp. 984-999). Suppose that the random variable of the duration until entering paid labour since first birth,  $T$  has a continuous probability distribution  $f(t)$ , where  $t$  is a realization of  $T$ . Then the corresponding cumulative distribution function is:

$$F(t) = \int_0^t f(x)dx = \Pr(T \leq t) \text{ and the survivor function } S(t) \text{ can be defined as } S(t) = 1 - F(t)$$

The hazard (or hazard rate), or the probability of entering the labour market at time  $t$ , given that the woman has not entered the labour market until time  $t$  since first birth is defined by:

$$h(t) = \lim_{dt \rightarrow 0} \frac{\Pr(t \leq T < t + dt | T \geq t)}{dt} = \lim_{dt \rightarrow 0} \frac{F(t + dt) - F(t)}{dtS(t)} = f(t) / S(t).$$

Since  $h(t) = f(t) / S(t) = [dF(t) / dt] / S(t) = [-dS(t) / dt] / S(t) = -d \ln S(t) / dt$ , we can obtain the survivor function:  $S(t) = \exp[-\int_0^t h(x)dx]$ .

We estimate the proportional hazard function, in which the hazard depends on a vector of (time-invariant) explanatory variables or covariates,  $\underline{x} = \{x_1, x_2, \dots, x_k\}$

with unknown coefficients  $\underline{\beta} = \{\beta_1, \beta_2, \dots, \beta_k\}$  and  $h_0$ :  $h(t, \underline{x}, \underline{\beta}, h_0) = \phi(\underline{x}, \underline{\beta})h_0(t)$ .

function  $h_0(t)$  is a 'baseline' hazard corresponding to  $\phi(\cdot) = 1$ . Then,  $h(\cdot)$  has an interpretation as the hazard function for the mean individual in the sample, which gives the shape of the hazard function for any individual.

The term  $\phi(\underline{x}, \underline{\beta})$  indicates the difference in the level of the hazard across individuals.



We specify this  $\phi(\underline{x}, \underline{\beta}) = \exp(\underline{x}'\underline{\beta})$ , following the popular specification.

We assume the baseline hazard function as:  $h_0(t) = pt^{p-1}$ , with  $p > 0$ .

In this case, the probability function is the Weibull distribution. The parameter  $p$  indicates 'duration dependency'. That is, the hazard of entering the labour market since first birth increases or decreases monotonically over time, if  $p > 1$  or  $p < 1$ . For  $p = 1$ , the hazard is time-independent, which brings us to the exponential distribution.

We estimate parameters  $\underline{\beta}$  and  $p$ , using maximum likelihood methods. In the likelihood function, right-censored spells i.e. the spells of women who have not entered the labour market after childbirth at the end of the observation period, contribute only to the survival component, whereas uncensored spells contribute to both the survival component and the conditional probability component. The positive coefficient estimates of  $\underline{\beta}$  indicate that higher levels of the variable increase the hazard of entering paid work, or equivalently, that the waiting time until starting market work is shorter. The negative coefficient estimates have the opposite effect. The hazard ratios, which are estimates of  $\exp(\underline{\beta})$ , indicate the effects of one-unit change in the corresponding variable. For example, if the hazard ratio of  $x_1$  is 1.10, it means 1 unit increase in  $x_1$  raises the hazard rate by 10 percent. If the hazard ratio is smaller than 1, it indicates a negative effect of  $x_1$  on the hazard rate. The proportional hazard model assumes that the ratio of the hazards of any two individuals is constant over time. We take the time of first birth for each individual as a time origin, and the number of months elapsed since first birth as a time scale. Our covariates  $\underline{x}$  are the years of education, a dummy variable whether or not the second child was born within 36 months since first birth, and a dummy variable whether or not the child was born in the 1990s.

Table 5 shows the results of a parametric duration analysis with the Weibull distribution. The table presents the hazard ratios of starting paid labour since first birth for mothers. We find that mother's education significantly increases the hazard of entering market work in Germany, Britain and the Netherlands. If the mother has one year longer in education, she is 5-12 per cent more likely to leave the full-time housewife status after first birth in these three countries. This result can be explained by potentially larger opportunity costs for higher educated women, since their wages are higher. For Sweden there is no statistically significant difference between women with different length of education. This is also in accordance with expectations. Since the paid parental leave benefit is proportional to forgone earnings it is not so much more costly for Swedish highly-educated women to remain at home with their babies during the parental leave period.

**Table 5. Proportional Hazard Models with Weibull Distribution, Duration of Time before Entering Paid Work since First Birth**

*(Z-values are in brackets)*

Covariate	Germany	Great Britain	Netherlands	Sweden
	Haz. Ratio	Haz. Ratio	Haz. Ratio	Haz. Ratio
Education of women	1.050 (2.09)	1.117 (9.25)	1.092 (3.29)	1.030 (0.90)
If 2nd child born within 36 months	0.515 (-4.92)	0.705 (-5.03)	1.025 (0.19)	0.600 (-2.95)
If child born in the 1990s	0.728 (-2.56)	1.353 (4.03)	1.123 (0.98)	0.761 (-1.61)
P	0.892 (-2.38)	0.683 (-13.54)	0.431 (-18.80)	0.903 (-1.50)
Log likelihood	-700.8	-2114.9	-1020.9	-311.1
LR Chi2(4)	34.9	135.7	11.0	10.2
N	548	1236	541	203

Germany: GSOEP 1984-1996, Great Britain: BHPS 1991-1997 and retrospective 1980-1991, The Netherlands: OSA 1985-1996 and retrospective 1980-1985, Sweden: HUS 1984-1998.

If a second child is born before the first child is three years old, we expect that duration of home time to be extended since with such short spacing we expect many mothers to see it as one spell with two births rather than separate career spells. In Germany, Britain and Sweden we find considerable decreases in the hazard of leaving full-time home caring if a second child is born shortly after the first child. However, in the Netherlands having a second child soon after a first has no effect on the time spent at home after first birth.

Finally a dummy variable is introduced for whether the child is born in the 1990s. We find that German mothers stay home longer in the 1990s than in the 1980s whereas British mothers return to paid work more quickly in the 1990s and Dutch and Swedish mothers have not changed their behavior.

Table 6 presents predicted values for the duration of home time estimated from our models of Table 5, split according to education of the mother. Since we found a significant effect of having a second child within 36 months of the first birth on the hazard of entering market work, we restrict our sample to those women who did not have a second child within 36 months of the first birth. Table 6 shows that comparing in the 1990s to 1980s, the predicted months of staying at home since first birth for the women who do not have their second child within 36 months since first birth has been increased in Germany and decreased in Great Britain. Consequently, Britain, Sweden and the Netherlands have become more similar to each other in the 1990s regarding the predicted time spent at home for first time mothers. The values of predicted time spent at home averages 14 months in Britain, 13 months in Sweden and 9 months in the Netherlands. Germany sticks out as the particular housewife country and the direction of change is making the country more exceptional rather than more like the other countries. The time predicted spent at home across educational groups is 32 months. Table 6 also shows that there is hardly any difference between educational groups in Sweden whereas in the other three countries mothers with higher education spend considerably shorter time periods as housewives.

**Table 6. Predicted Time Spent at Home for First Time Mothers Who Did Not Have A Second Child within 36 Months since First Birth, by Educational Groups**

	1980s			1990s			1980s	1990s
	High	Medium	Low	High	Medium	Low	All	All
<b>Germany</b>								
months	16.6	21.0	23.5	24.2	29.0	33.6	22.3	31.5
N	18	39	117	26	45	146	174	217
<b>Great Britain</b>								
months	10.9	16.0	29.7	7.2	10.4	18.3	24.6	14.0
N	60	54	250	98	58	206	364	362
<b>The Netherlands</b>								
months	5.1	10.6	16.4	4.2	8.1	13.1	12.3	9.3
N	32	103	99	29	93	70	234	192
<b>Sweden</b>								
months	8.4	9.3	10.2	11.3	12.5	13.7	9.5	12.6
N	9	13	17	31	23	39	39	93

Germany: GSOEP 1984-1996, Great Britain: BHPS 1991-1997 and retrospective 1980-1991, The Netherlands: OSA 1985-1996 and retrospective 1980-1985, Sweden: HUS 1984-1998.

## 7. Conclusions

In this paper we have shown that there has been a substantial postponement of maternity comparing the age at which women gave birth in the 1980s to that of the 1990s. Cross-country differences in family policies lead to different solutions in the parental work and family reconciliation across countries. Our hypothesis is that less compatibility of market work and childbearing leads to greater hesitation among young women to start a family and therefore a higher probability that first births will be postponed.

From the parametric duration analyses, we find that German mothers stay at home longer after first childbirth in the 1990s than in the 1980s whereas British mothers return to paid work more quickly after first childbirth in the 1990s than in the 1980s. For Dutch and Swedish mothers, we do not find a significant change in their behaviour concerning home time after first childbirth. The pattern of spending more time at home in the 1990s compared to the 1980s in Germany is consistent with the observation that maternity has been postponed comparing these periods in Germany.

Our results of duration analyses confirm that education has a positive effect on leaving the full-time housewife status after first birth in Great Britain, Germany and the Netherlands. This can be explained by potentially higher opportunity costs for highly educated women (with relatively high wages) compared to women with lower levels of educational attainment. Paid parental leave is short but highly paid in the Netherlands and Britain and long but with low payment rates in Germany. In Sweden, education does not have a significant effect on the probability of returning to the market work for first-time mothers. This is in line with expectations, as paid parental leave compensates forgone earnings proportionally. Income support during the parental leave period is so designed that caring at home for young children is not more costly to highly educated Swedish mothers compared to mothers with lower levels of educational attainment, abstracting from the impact long-term leave may have on career progression.

Comparing predicted home time after first birth in our four countries leads us to observe that Britain, Netherlands and Sweden have become more similar in the 1990s, whereas Germany in the 1990s stands out as “a housewife country”, with a predicted time spent at home after first childbirth of 32 months.

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## ANNEX

**Table A1. Means and Standard Deviations (in brackets) corresponding to Tables 5 and 6**

	<b>Germany</b>	<b>Great Britain</b>	<b>Netherlands</b>	<b>Sweden</b>
Education of women	11.8 (2.42)	11.5 (2.78)	11.7 (2.00)	12.5 (2.58)
If 2nd child born within 36 months	0.29 (0.45)	0.41 (0.49)	0.21 (0.41)	0.35 (0.48)
If child born in the 1990s	0.52 (0.50)	0.41 (0.49)	0.38 (0.49)	0.62 (0.49)
N	548	1236	541	203

Germany: GSOEP 1984-1996, Great Britain: BHPS 1991-1997 and retrospective 1980-1991, The Netherlands: OSA 1985-1996 and retrospective 1980-1985, Sweden: HUS 1984-1998.

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