

Rønsen, Marit; Sundström, Marianne

**Working Paper**

## Public Policies and the Employment Dynamics among new Mothers - A Comparison of Finland, Norway and Sweden

Discussion Papers, No. 263

**Provided in Cooperation with:**

Research Department, Statistics Norway, Oslo

*Suggested Citation:* Rønsen, Marit; Sundström, Marianne (1999) : Public Policies and the Employment Dynamics among new Mothers - A Comparison of Finland, Norway and Sweden, Discussion Papers, No. 263, Statistics Norway, Research Department, Oslo

This Version is available at:

<https://hdl.handle.net/10419/192245>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

*Marit Rønsen and Marianne Sundström*

**Public Policies and the  
Employment Dynamics among  
new Mothers – A Comparison of  
Finland, Norway and Sweden**

**Abstract:**

This paper compares the employment patterns of women after first and second birth in Finland, Norway and Sweden during 1972-92, focusing on the impact of parental leave and childcare programs on the transitions to full-time and part-time work. The results unanimously point to the great importance of the programs. Women who are entitled to a paid leave resume employment faster than non-eligible women. As leave periods are prolonged the difference between the two groups diminishes but still prevails in the end of the study period. The higher entry risks for entitled mothers remain after controlling for own wage and spouse's income.

**Keywords:** Female labor supply, maternity/parental leave, childcare, childbirth, hazard rate model

**JEL classification:** J 22, J 13

**Acknowledgement:** We thank the Swedish Research Council for the Social Sciences, the Swedish Council for Research in the Humanities and Social Sciences and the Joint Committee of the Nordic Social Science Research Councils for financial support. We also thank Statistics Finland for their hospitality and for giving us access to the Finnish data. Finally, we thank colleagues in Statistics Norway and seminar participants at the ESPE meetings, the Research Institute of the Finnish Economy and the Swedish Institute for Social Research for their comments.

**Address:** Marit Rønsen, Division for Social and Demographic Research, Statistics Norway. E-mail: marit.ronsen @ssb.no

Marianne Sundström, Demography Unit, Stockholm University, S-10691 Stockholm, Sweden. E-mail: Marianne.Sundstrom@suda.su.se

---

**Discussion Papers**

comprise research papers intended for international journals or books. As a preprint a Discussion Paper can be longer and more elaborate than a standard journal article by including intermediate calculation and background material etc.

Abstracts with downloadable PDF files of  
Discussion Papers are available on the Internet: <http://www.ssb.no>

For printed Discussion Papers contact:

Statistics Norway  
Sales- and subscription service  
N-2225 Kongsvinger

Telephone: +47 62 88 55 00  
Telefax: +47 62 88 55 95  
E-mail: [Salg-abonnement@ssb.no](mailto:Salg-abonnement@ssb.no)

# 1. Introduction

Numerous studies for many countries have found female labor supply to be influenced by wages, taxes and family income as well as by the ages and number of children. Since labor supply decreases with the number of children and increases with the age of a child, public policies which facilitate the combination of paid work and child-rearing should be expected to stimulate women's labor market activity. As the birth of a child accentuates the conflict between market work and household work, the impact of public policies on women's behavior at this point in life is of particular interest.

While women's return to work after childbirth has been the topic of several later studies (see e.g. Even, 1987; Shapiro and Mott, 1994; Joesch, 1994), few have taken the possible effects of public policy into account. Recently, however, the impact of maternity leave policies has received increased research attention (see e.g. Ondrich et al., 1996, 1998; Joesch, 1997; Rønsen and Sundström, 1996).<sup>1</sup> The effect of parental leave mandates on women's labor market outcomes has also been addressed by Ruhm (1998), using aggregate data for several European countries. In addition, the relationship between new mothers' return to work and their child care choice has been analyzed by Leibowitz, Klerman and Waite (1992), while Gustafsson and Stafford (1994) have studied the effects of child care availability on female labor supply in three countries. None of the mentioned studies have, however, considered the joint effects of parental leave and child care programs.

A limitation of the micro-level studies of parental/maternity leave policies is that they have focused exclusively on women who were employed before birth (Ondrich et al., 1996, 1998; Joesch, 1997; Jonsson and Mills, 1998). Another limitation is that the studies have analyzed (re)entries either for first-time mothers only (Leibowitz, Klerman and Waite, 1992; Shapiro and Mott, 1994; Rønsen and Sundström, 1996) or for first and higher birth-orders together (Ondrich et al., 1996, 1998; Joesch, 1997; Jonsson and Mills, 1998). In addition, with the exception of Ondrich et al. (1998), none of the previous studies have distinguished between return to full-time and part-time work. By contrast, we study the effects of both parental leave and child care policies and compare full-time and part-time employment (re)entries for first-time and second-time mothers, regardless of prior work history, in three Nordic countries, Finland, Norway and Sweden.

The Nordic countries are renowned for their extensive family policies which stimulate the gainful employment of mothers of young children and reduce the cost of having children (see e.g. Sundström and Stafford, 1992). Thus, employment rates among mothers of young children and fertility rates are

---

<sup>1</sup> No doubt, the passing of the 1993 Family and Medical Leave Act in the U.S. and the debate preceding it have spurred research interest in the effects of parental leave policies.

relatively high compared to many other European countries (Eurostat, 1995; Council of Europe, 1995). In Norway and Sweden part-time work has played an important role in the employment of women. Almost half of all female employment in these countries is part time (see Figure 1). In Finland, however, only about ten percent of employed women work part time, which is very low also in comparison to most other Western countries. We compare the (re)entry process after first and second birth in the three countries over a twenty-year period and analyze to what extent the country-differences are the results of differences in parental leave and child care policies, in different responses to similar policies, or to other factors.

The outline of the paper is as follows: the next section gives a brief overview of the parental-leave and child-care programs of the countries and compares the trends in full-time and part-time work among Finnish, Norwegian and Swedish women. Section 3 sets out the theoretical framework and our empirical model. The data and variables used in the analysis are presented in Section 4. We report our findings in Section 5 and end by a summary and discussion.

## **2. Family policy and female employment in Finland, Norway and Sweden**

### **2.1. Maternal and parental leave programs**

In the three countries we analyze, a universal right for working women to paid leave in connection with childbirth dates back to the late 1950s or early 1960s. In 1972, the first year of our study, the leave period was still rather short in Norway and Finland (12 weeks), whereas in Sweden it was already six months (Figure 2). During the following two decades the leave programs were extended several times. The fastest expansion took place in Finland, where the entitlement period in 1974 was prolonged to 29 weeks, slightly above the Swedish level at the time. Following a series of smaller extensions, the Finnish parental leave reached 43 weeks in 1981. Since 1987 the leave period has been 263 days or about 44 weeks, except in 1991-92 when it was temporarily two weeks longer. Sweden also extended their leave program considerably during the late 1970s, and by 1980 employed parents could take a full year's leave after childbirth. In 1989 the leave period was further prolonged to 15 months. Compared to Swedish and Finnish mothers, Norwegian mothers had a much shorter leave entitlement throughout the period studied. An extension in 1977 granted a period of 18 weeks, which remained the rule until 1987, when two more weeks were added. Later there has been a series of expansions, resulting in a maximum leave of one year in 1993. However, in the final year of analysis for Norway, 1988, the maximum leave period was still only 22 weeks.

Other characteristics of the countries' parental leave programs are summarized in Table 1. Maternal or parental benefits are financed through general taxes, and are based on prior earnings in all three countries. Initially, compensation levels were relatively low, but after major revisions in 1974 for Sweden, 1978 for Norway and 1982 for Finland, maximum replacement rates were raised to 90 percent, 100 percent and 80 percent, respectively. The Norwegian leave program is the only one that requires a certain amount of employment during pregnancy in order to qualify for benefits. Entitlement in Finland and Sweden requires earnings above a low level a certain period prior to birth (see Table 1). In all countries, non-eligible mothers also receive some support. In Norway this is a one-time tax-free cash transfer at birth, while in Finland and Sweden it is a taxable (low) flat rate payment during the leave period.

Sweden was the first country to introduce parental leave, when in 1974 it allowed fathers to share the then six-months leave. Norway and Finland followed suit in 1977 and 1978, respectively, granting fathers the right to share parts of the leave. Further, parents may take extra unpaid leave subsequent to the standard parental leave - in Sweden until the child is 18 months old and in Norway until it is one year old. Finnish parents only received such rights in connection with the introduction of the special home care allowance scheme in 1985. This scheme gave parents the right to choose between a place in a public day-care institution and an extra income transfer - home-care allowance - to make their own child care arrangements (see Ilmakunnas (1997) for further details). Parents in all three countries are guaranteed job security during the mandatory paid or unpaid leave.<sup>2</sup>

A special feature of the Swedish program is its high degree of flexibility. Benefits may be used full time or part time or saved and used any time before the child is eight years old. During the period studied this was not the case in Finland and Norway. Norwegian parents had to exhaust all their eligibility in one go or they would forfeit remaining benefit days, while in Finland they would be paid at the minimum flat rate for the remaining period. In addition, Swedish full-time employed parents have had a statutory right to reduced working hours since 1979. Finnish parents got similar rights in 1988, but only for children aged 0-3 and in connection with school start (Salmi, 1994). In Norway, only breast-feeding mothers have had a universal right to reduced working hours. A last unique aspect of the Swedish system is a feature that encourages a closer spacing of births (see Hoem, 1993). Since 1980, mothers have had the right to maintain the same benefit level as with the previous child without returning to work if she had another birth within 24 months (from 1986: within 30 months). Before 1980, benefits for a subsequent child were based on the earnings record between births, as they are in Norway and normally also in Finland.

---

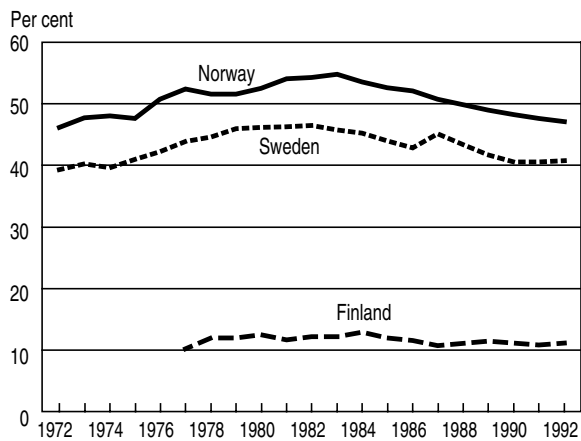
<sup>2</sup> In Sweden this requires that the parent has worked with the employer the last six months or at least 12 of the last 24 months before birth.

**Table 1. Characteristics of parental leave policies in Finland, Norway and Sweden 1972-1992<sup>1</sup>**

Characteristic	Finland	Norway	Sweden
Eligibility criteria for earnings compensation	Earnings above a minimum level latest taxation year or last 6 months before birth	Before 1977: Employed 8, later 6, of last 10 months before birth	Earnings for at least 240 days before birth.
Maximum earnings compensation <sup>2</sup>	Before 1982 about 45%, later 80%. From 1992: further reductions. <sup>3</sup>	Before 1978: NOK 4/day plus 0.1%. Later 100%.	Before 1974 about 65%, later 90% <sup>4</sup> . Flat rate last 3 months since 1980.
Support to non-eligible mothers	Flat rate taxable payment during statutory period. 1992: FIM 63/day.	One-time, tax-free cash transfer at birth. 1992: NOK 14825.	Flat rate taxable payment during statutory period. 1992: SEK 60/day.
Right for fathers to share leave	From 1978. Gradually extended from 2 weeks to all except first 105 days (since 1987).	From 1977. 6 weeks after birth reserved for mother.	From 1974. Father may share whole period.
Right to extra unpaid leave	From 1985. During home-care allowance period (see below).	From 1977 until child is one year old.	Since 1978 until child is 18 months old.
Leave flexibility	No. One continuous spell, no part-time leave.	No. One continuous spell, no part-time leave.	From 1974: Use benefits ¼ or ½ of full time. Save parts of leave till later, until child is 8 years old.
Home-care allowance	From 1985, fully developed 1990. Following paid parental leave and until child is 3 years old if parents do not use subsidized day-care. <sup>5</sup>	No	No
Universal right of parents to reduced working hours	From 1988. Children aged 0-3 and in connection with school start	Only for breast-feeding mothers. 2 hours with full pay in public sector, 1 hour unpaid in private sector.	From 1979. 75 percent of full-time. Children aged 0-7.

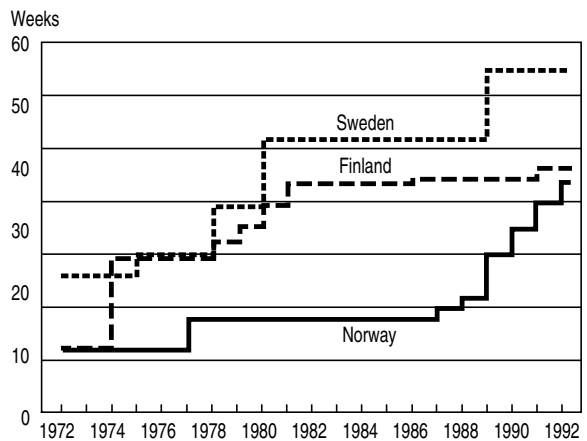
<sup>1</sup> See Fig. 2 for length of paid leave. <sup>2</sup> Earnings above a relatively high ceiling have been compensated at a reduced rate in all countries. In Sweden, the last three months of the leave have been compensated at a flat rate equal for all since 1980. <sup>3</sup> From 1.1.1992: 75%; 1.9.1992: 70% and 1.1.93: 66%. <sup>4</sup> From 1996: 75%. From 1998: 80% <sup>5</sup> Home-care allowance is taxable and consists of a basic payment, sibling supplement and an income tested additional payment. In 1992, the basic payment amounted to FIM 1,951 per month and the maximum additional payment was FIM 1,561 per month. In addition, some municipalities grant an extra amount which varies considerably from one municipality to another

Figure 1. Proportion of employed women working part-time



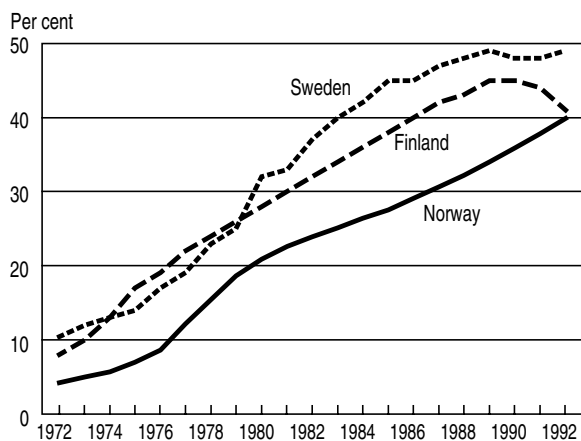
<sup>1</sup> Norway and Sweden: 1-34 hours per week, Finland: 1-29 hours per week  
<sup>2</sup> Sweden 1986-1992: New method which overestimates part-time employment as compared to the old method. Norway: Before 1988, actual working hours. After 1988, settled working hours  
 Sources: Statistics Norway: Historical statistics 1994; Statistics Sweden: Labor Force Surveys; Statistics Finland: Labor Force Surveys

Figure 2. Length of paid maternity leave



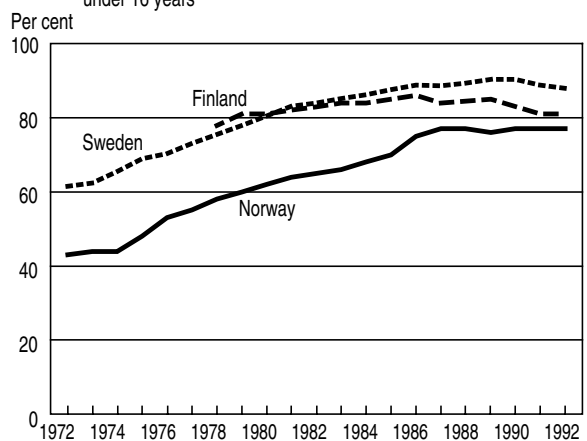
Sources: Norway: L. Hansen, Interne notater 91/17, Statistics Norway 1991 and Ministry of Children and Family Affairs; Sweden: Sundström 1995; Finland: Ministry of Social Affairs and Health

Figure 3. Child care spaces per 100 children aged 0-6



Sources: Statistics Norway: Historical statistics 1994; Statistics Sweden: Statistiska meddelanden, S:10 SM 8901; Statistics Finland: Statistical yearbook 1995 and STAKES, National Research and Development Centre for Welfare and Health

Figure 4. Married and cohabiting women in the labour force with children under 16 years<sup>1</sup>



<sup>1</sup> Sweden: Children 0-16 years, Finland: Children under 18 years  
 Sources: Statistics Norway: Historical statistics 1994; Statistics Sweden: Labor Force Surveys; Statistics Finland: Labor Force Surveys

## 2.2. Subsidized child care

The Nordic countries have more extensive public day-care facilities than most other European countries. In the beginning of the period studied, the coverage rates were low, however. In 1973 about 5 percent of Norwegian pre-school children had a place in public day care, while the Finnish and Swedish enrollment rates were about 10 percent (Figure 3). During the 1970s public child care expanded rapidly, and by 1980 21 percent of Norwegian, 28 percent of Finnish and 32 percent of Swedish pre-schoolers were enrolled. After 1990, when the Finnish home-care allowance system was fully developed, child care coverage in that country declined. By 1992 the Norwegian enrollment rate



was on par with the Finnish level, covering about 40 percent of pre-school children, while Sweden was still in the lead with 49 percent enrolled. Coverage rates are lower for children aged 0-2 years than for 3-6 year-olds (Nordic Council of Ministers, 1995).

Parents' fees are set by the municipalities and cover only a fraction of running costs. Generally, the fees increase with family income and decrease with the number of siblings. Finnish and Swedish parents usually pay lower fees but, unlike Norwegian parents, they cannot deduct any of the costs from their taxable income. Since there is excess demand for child care at the going prices there is a waiting list, and as children are often put on the waiting list shortly after birth, older children are more likely to get a space. Siblings and children of single parents usually get priority to spaces and pay reduced rates. The excess demand has been met by several forms of private child-care arrangements, provided for example by relatives, private child minders or private day-care centers. This type of child-care has been more common in Norway.

### **2.3. Labor market patterns**

Labor force participation among Nordic mothers of pre-school children is high in comparison with other countries, and ranged from 84 percent in Sweden to 73 percent in Norway and Finland in 1992-93. However, the country trends vary over the period studied. In Sweden, and especially in Norway, female participation rates rose strongly during the 1970s and 1980s, while Finland had high participation rates already in the 1950s and 1960s. In 1978, the earliest year for which we have comparable data for mothers, 73 percent of Finnish mothers of children 0-6 years participated in the labor force as compared to 69 percent of Swedish mothers and only 48 percent of Norwegian mothers.<sup>3</sup> Similar relationships are displayed for mothers of children under 16 in Figure 4.

Another striking difference in labor market behavior between the countries is the extent and trends of part-time work (see Figure 1). Norway has had the highest proportion of part-time workers among employed women, but the difference between Norway and Sweden, on the one hand, and Finland, on the other, is huge. In Sweden, moreover, the proportion working part time has been higher among employed mothers of pre-school children than among all employed women, while in Norway there has been little difference between these groups. Therefore, the part-time rate among employed mothers of pre-school children was rather similar in Sweden and Norway (50-60 percent) during the period studied, and, except for a decline since the mid 1980s, it increased in both countries. In Finland, by contrast, the part-time proportion has been very low among all groups of employed women, including

---

<sup>3</sup> The data are from the countries' Labor Force Surveys and refer to all mothers of pre-school children for Sweden but to cohabiting and married mothers for Norway and Finland.

mothers of pre-schoolers, and this proportion has, furthermore, remained more or less constant over time (about 13 percent).<sup>4</sup>

The longer tradition of gainful, and mainly full-time, employment among Finnish women may in part be a result of the for long lower per capita income in Finland after the second world war, and in part by differences in country-specific cultural norms and values, generated for example by the way industrialization took place (see Pfau-Effinger, 1993). Another important country difference has been the lower fraction of rental flats and accompanying higher housing costs in Finland (Nätti, 1995). Therefore, disposable income net of housing costs has been lower and Finnish women have been less able to afford part-time work. For these reasons the supply of part-time labor has been very low in Finland, and part-time work has become a more marginal phenomenon than in Norway and Sweden. Indications of the marginality of Finnish part-time work is the lower union density, the higher proportion of temporary jobs, the higher proportion of involuntary part-time work and the larger extent of short part-time work as compared to Sweden, in particular, but also to Norway (Nätti, 1995).

### **3. Conceptual framework and empirical model**

Our point of departure is an intertemporal labor supply model in which fertility decisions already have been made (see e.g. Even, 1987; Leibowitz, Klerman and Waite, 1992). The mother maximizes discounted expected utility, and enters employment - full time or part time - when her full wage exceeds her reservation wage. The full wage reflects her opportunity costs of not working and consists of the current market wage as well as the present value of the reduction in future earnings associated with depreciation and non-accumulation of human capital. The reservation wage is the lowest wage rate at which the woman is willing to work. It reflects the utility of her time at home, including the value of her home production (measured in the price of market substitutes). The birth of a child will raise the reservation wage by increasing the demand for the mother's time in child care, but will also lower it by increasing the demand for market inputs in home production (see Hotz and Miller, 1988). Since the time component is more important when the child is young, the presence of a newborn child will raise the reservation wage, but as children grow older they become less time-intensive and more goods-intensive. Hence, the reservation wage is hypothesized to fall with time since birth. The timing of the return to work will thus depend on changes in the reservation wage and in the full wage and the choice between full-time and part-time entry will depend on which alternative yields the highest expected utility. At equal reservation wages, we expect women with higher market earning capacity to

---

<sup>4</sup> In the Norwegian and Swedish Labor Force Surveys part-time work is defined as work of 1-34 hours per week, but in the Finnish Labor Force Surveys the definition is 1-29 hours per week. Applying the 1-34 hours definition would raise the Finnish part-time rates very little.

choose full-time work rather than part-time work. Conversely, women who have higher reservation wages, at equal full wages, would tend to choose part-time work.

The availability of a paid maternity leave will influence women's labor market behavior in several ways. First, it gives mothers-to-be strong incentives to be employed prior to birth in order to qualify for benefits, and prolonged leave periods will strengthen these incentives. Thus, the fraction of mothers entitled to leave will rise over time, as will the heterogeneity of mothers on leave (see Jonsson and Mills, 1998). Second, after childbirth paid leave will obviously increase the reservation wage, thereby making women less inclined to return to work while they are entitled to benefits.<sup>5</sup> Extensions of the entitlement period will tend to prolong their stay at home.<sup>6</sup> On the other hand, a longer leave period will, as pointed out e.g. by Klerman and Leibowitz (1999) and Joesch (1997), facilitate the return to work of mothers who prefer to stay home longer and who would have dropped out of the labor force had the leave been shorter. Thus, the effect of paid maternity leave - and its length - on the average duration of mothers' time out of work after childbirth will be ambiguous. We do not, however, study the incentive effects of a paid maternity leave, that is, we do not model the choice of securing eligibility or not. Rather, we limit the focus to the employment process after childbirth, and since leave eligibility is determined before the start of this process, we will regard maternity leave status as exogenous in the model.

The impact of increases in the availability of subsidized child care is more clear cut: As the price of market substitutes falls, the value of home production will decrease and hence the reservation wage, which will accelerate the return to work.

Guided by these theoretical considerations, we estimate a dynamic reduced-form model of employment entry. When modeling these dynamics, the hazard rate is a useful concept. The hazard rate (multiplied by  $\Delta t$ ) yields the instantaneous probability that an event occurs within a certain short time interval  $(t, t+\Delta t)$  given that it has not occurred before. In our case, the career break ends with an exit to either full-time or part-time work. We then have a so-called competing-risk model. Let the stochastic time-variable  $T$  denote the duration in the initial state, and let  $J$  denote the end state. The event-specific hazard function can then be written

---

<sup>5</sup> This holds to a greater extent for Norway and Finland than for Sweden, since in the two former countries it was not possible to go back to work and save leave days for future usage during the period studied.

$$(1) \quad h_j(t) = \lim_{\Delta t \rightarrow 0^+} P(t \leq T < t + \Delta t, J=j \mid T \geq t) / \Delta t; \quad j=1,2; t \geq 0$$

Individuals experiencing an event other than  $j$  are treated as censored at the time of the other event. Since the two events are mutually exclusive the overall hazard function  $h(t)$  - the hazard of employment entry regardless of working hours - is just the sum of the full-time and part-time hazards.

There is little *a priori* knowledge of the functional form of the hazard rate of employment after birth. A rising full wage and a falling reservation wage imply a rising hazard rate, while a falling full wage and a rising reservation wage imply a falling hazard rate. If the full wage and the reservation wage develop in the same direction, the direction of the resulting hazard is ambiguous. We have chosen the Cox proportional hazards model, since it makes no assumption about the functional form of the baseline hazard (Cox, 1972).

Besides depending on time, the hazard rate will vary with individual characteristics. In the competing risk case it can be written

$$(2) \quad h_j(t; X) = h_{0j}(t) \exp[X(t)\beta_j]$$

where  $h_{0j}$  is the unknown baseline hazard rate of event  $j$ ,  $X$  is a vector of covariates which may or may not depend on time and  $\beta_j$  is a vector of parameters associated with event  $j$ . The estimates of the hazards for full-time and part-time are obtained by maximum likelihood estimation. It can be shown that the overall likelihood function for the event of employment can be split into a separate likelihood function for each of the full-time and part-time events. Estimation can be carried out simultaneously for both events or separately for each event. As long as there are no restrictions on the parameters across the event-specific rates and no unobserved variables common to, or correlated across, the rates, these procedures yield identical results. We base our analysis on these assumptions.

The women are followed for 36 months or until they make their first transition to full-time or part-time work, which is defined as 10-34 hours per week in the Norwegian survey, 20-34 hours in the Finnish survey and 16-34 hours in the Swedish survey. We right censor at 36 months after birth, at next birth, at separation from the partner or at interview, whichever comes first.

---

<sup>6</sup> It is possible also that maternity leave with job-security will imply a smaller reduction in subsequent wages than that incurred by a work interruption without the right to go back to the same job, since the mother maintains some of her job-specific human capital (see Albrecht et al. 1998). If this is the case, the full wage may fall during maternity leave and induce women to stay home longer.

## 4. Data and variables

### 4.1. Sample

The data are from the 1988 Norwegian Family and Occupation Survey, the 1989 Finnish Population Survey and the 1992 Swedish Family Survey, which are very similar in design. The surveys are national probability sample surveys of selected cohorts, containing retrospective life histories on childbearing, cohabitation and marriage, educational activities and employment. Interviews were obtained from a total of 4,019 Norwegian women born between 1945 and 1968, 4,155 Finnish women born between 1938 and 1967 and 3,314 Swedish women born between 1949 and 1969. Our analysis comprises women who gave birth to a first or a second child in 1972-89 for Finland, 1973-88 for Norway and in 1972-92 for Sweden.<sup>7</sup>

Since the hazard model does not include a random term, it is important to keep the sample as homogeneous as possible. We therefore restrict our analysis to women who were married or living in a consensual union and were at least 19 years old at first birth. Further, we exclude women whose first or second birth was a multiple birth, whose child died shortly after birth and those who lived abroad at the time of birth, as well as some cases of inconsistent or incomplete information. Women with no reported work interruption have been omitted from the Finnish and Swedish sample, but for Norway this was not feasible as spells of maternity leave were underreported to some extent.<sup>8</sup> Since Norwegian mothers would forfeit benefits completely if they went back to work before the leave expired, they are unlikely to have done so.<sup>9</sup> If women were eligible for leave, but reported no or too short a leave compared to the statutory period, we have set their employment break equal to the statutory leave at the time of birth.<sup>10</sup> The final samples of first-time mothers include 1,645 Finnish mothers, 1,366 Norwegian mothers and 1,618 Swedish mothers, while the samples of second-time mothers include 1,387, 1,142 and 1,285 mothers, respectively.

### 4.2. Covariates

Following the theoretical discussion in Section 3 we include as model covariates indicators of the full wage, the reservation wage and family policy. The potential *market wage* is a central component of the full wage. By raising the full wage, a higher potential market wage is expected to speed up employ-

---

<sup>7</sup> The first year for which we have information on child care coverage is 1972 for Sweden and 1973 for Norway. That determined our starting years, while the ending years are the years of interview.

<sup>8</sup> The interviewers were instructed to consider women on maternity leave as employed, which is consistent with international convention. In addition, they were to register a special code for maternity leave, but these practices seem to have differed somewhat (see Kravdal 1992a for further documentation).

<sup>9</sup> There are no official statistics to confirm this, but is also the view of the Norwegian National Insurance Administration (pers. comm.).

ment entry after birth and to encourage full-time work in particular. For Sweden we have complete information on monthly wages from administrative registers once a year since 1968 for all public sector employees and private sector white-collar workers, but for private sector blue-collar workers information is largely missing.<sup>11</sup> Wages of part-time workers have been calculated into full-time equivalents by Statistics Sweden.<sup>12</sup> For Norway we also have register information linked to the survey data, but on annual income rather than wages. However, together with all full-time and full-year employment observations of women in the Norwegian survey, this has been used to predict hourly wages.<sup>13</sup>

As there is no wage or income information for Finland, we instrument the full wage by human capital variables. Such variables have, however, also been kept in the Norwegian and Swedish models even when the wage is included, as differences in human capital may reflect unobserved components of the full wage, such as reductions due to depreciation and non-accumulation of skills. Previous research has, for example, suggested that women with more schooling and longer work experience have higher depreciation rates than other women. (see e.g. Gronau, 1988; Albrecht et al., 1999). Hence, we expect a positive effect of education and employment experience, net of the wage, especially on the full-time hazard. Age at birth is hypothesized to have a negative effect on entry rates, since younger women have longer work horizons and thereby lose more from a work interruption. They may also prefer a full-time job, since they may lose more in terms of future earnings by working part time. *Age at birth* is grouped into intervals: 19-22 years, 23-26 years and 27 years or older for first-time mothers and 19-24, 25-29 and 30 years or older for second-time mothers.<sup>14</sup> *Education* is the highest level attained at birth, and is divided into three categories: compulsory schooling only (9 years), 1-3 years of gymnasium and education beyond gymnasium level. *Work experience* is constructed from the employment histories, and is the full-time equivalent number of years worked by the time of birth, accumulated from the year of the mother's 17th birthday.<sup>15</sup>

---

<sup>10</sup> More detailed analysis shows that the results are insensitive to whether or not this procedure is adopted.

<sup>11</sup> Since we cannot distinguish between working women with missing wages and women who did not work, it was not possible to predict wages for Sweden.

<sup>12</sup> For more information about the wage data, see Albrecht et.al. (1998).

<sup>13</sup> The estimates are obtained by a two step procedure, adjusting the wage equation for possible selection bias introduced by using full-time and full-year observations only (further details of the estimation procedure can be obtained on request).

<sup>14</sup> As age, education and work experience are all correlated, it is difficult to assess their separate effects. To make up for some of this, we have categorized the age variable.

<sup>15</sup> The reliability of the employment histories has been checked for Sweden in Hoem (1995) and for Norway in Kravdal (1992b). They both find that the information agrees very well with the Labor Force Surveys and is of high quality.

As argued previously, we expect a negative relationship between the reservation wage and the age of the child. After first birth the variation in the reservation wage will be picked up by the duration variable itself. After second birth the effect of the age of the first child is hypothesized to be positive, i.e. the older the first child at second birth, the sooner mothers will start working.

Assuming a positive income effect on the demand for the mother's time in home production and child care, higher *husband's or partner's income* is expected to increase the reservation wage and hence delay employment entry. For Sweden we have register information on annual earnings of husbands as well as of partners in consensual unions (since 1968). For Norway we have similar information on annual income, but only for spouses in marriages that were intact in December 1987. For Finland data on partners' income are not available, but we do know their education at union start and use this as an indicator. *Partner's educational level* is grouped in two where the highest level corresponds to at least gymnasium level education.

Presumably, women with more persistent work careers have lower reservation wages than other women, other things being equal. Work during pregnancy has, for example, been found to be a strong predictor of after-birth employment in several studies (see e.g. Even, 1987; Joesch, 1994; Shapiro and Mott, 1994; Rønsen and Sundström, 1996). By working late into pregnancy, women not only maintain a high level of on-the-job training, but also signal a higher degree of work commitment. They also more often qualify for a paid maternity leave. Because of the strong correlation between work during pregnancy and maternity leave, especially in Norway, our indicator, *prior home-time*, is not limited to pregnancy only, but is the accumulated number of months between the last spell of pre-birth employment or educational activity and the time of birth.

An interesting question is whether, in countries like Norway and Sweden where part-time work is common, the persistence in female employment extends also to women's hours of work. To address this issue we have included an indicator of full-time and part-time work before birth. As very few women work part time before they have children, this indicator is only used for second-time mothers. The variable is labeled *between birth employment* and is divided into 1) none, 2) part-time only or mixed part-time/ full-time work and 3) full-time work only.

To analyze the labor supply effects of public policies one should ideally model their impacts on the individuals' budget sets. This is, however, not feasible as we study three countries over almost twenty years and information on parental benefits, child care costs etc. is not available. Our approach has been to let *maternity leave status* at birth indicate whether or not the mother was entitled to benefits, and to instrument the extended generosity of the programs by the statutory *length of the parental leave*

at the time of birth. Since, however, there is little reason to believe that the length of the leave affects the timing of job entry among non-entitled mothers, this variable is only included in interaction with leave status. For Finland and Sweden the information on maternity leave status is based on the respondents' own reports, while for Norway it has been constructed on the basis of the eligibility criteria and the pre-birth employment records. Since there were very few leave extensions in Norway during the period analyzed, we have split leave length in two groups, 12 weeks and 18-22 weeks, while for the two other countries it is a continuous variable, measured in months.

A basic assumption of the Cox model is that the ratio of the hazards of any two individuals is constant over process time. This is not a realistic assumption for mothers with different maternity leave status, as the entry risk of mothers on leave is likely to be low during the statutory leave and to rise quickly when the leave expires. The hazard of non-entitled women, on the other hand, is not shaped by the leave program. Hence, we expect the ratio of the hazards of the two groups to change with time since child birth, and this change to be concentrated around the end of the statutory leave. To model this non-proportionality we have, first, defined a time-varying indicator that equals zero for exposure times up to and including the month of leave expiry and one for later exposure times. Next, we multiply this indicator with leave status and leave length and include it as a three-way interaction term. The interaction with leave status follows from the above, while the argument for an interaction with leave length is that the increase in the hazard of the leave-group relative to the non-leave-group at the time of leave expiry may not be independent of the length of the leave. A reasonable assumption may, for example, be that this increase becomes smaller as the statutory leave is prolonged.

Linking register information to the survey data, we have been able to construct an indicator of the local supply of subsidized day-care for Norway and Sweden. The indicator is *child care coverage* in the municipality, defined as the number of spaces per 100 pre-school children at the time of birth.<sup>16</sup> Assuming that a higher coverage rate implies a larger child-care supply at lower costs, it is expected to speed up the return to work. However, as spaces have been rationed due to excess demand for most of the period studied, a higher coverage rate may not necessarily imply a higher probability of obtaining a space. This could impair the significance of our indicator. Since there have been large regional differences in child care coverage in both countries, the variable could also pick up regional labor market differences. To purge the child care coefficient of such effects, we control for region of residence. As the regional effects are mainly of national interest, they are, however, not presented.

---

<sup>16</sup> For Norway the coverage rate is per 100 children aged 0-3, while for Sweden it is per 100 children aged 0-6.



**Table 2A. Descriptive statistics for variables used in the analysis - Finnish women.**

	First birth	Second birth
Maternity leave status		
On leave	81.6	68.4
<b>Not on leave</b>	18.4	31.6
Length of stat. leave (months)	8.0	8.3
Homecare allowance (years)	0.5	0.9
Education:		
<b>Compulsory schooling</b>	21.4	23.4
1-3 years gymnasium	65.6	62.7
Post-gymnasium education	13.0	14.0
Work experience (years)	5.5	7.0
Prior home-time (months)	2.6	8.2
Mother's age at birth		
<b>19-22<sup>a</sup> / 19-24<sup>b</sup></b>	25.3	18.4
23-26 <sup>a</sup> / 25-29 <sup>b</sup>	38.7	46.1
≥ 27 <sup>a</sup> / ≥ 30 <sup>b</sup>	36.0	35.5
Between-birth employment		
Full-time only		69.4
Part-time or mixed FT/PT		10.5
<b>None</b>		20.1
Age of 1st child (years)		3.9
National unemployment rate:		
High (≥ 5.4%)	33.7	12.1
<b>Low</b>	66.3	87.9
Partner's education		
< <b>gymnasium level</b>	77.1	79.3
≥ gymnasium level	22.9	20.7
Duration: all <sup>c</sup> (months)	13.7	16.5
full-time	11.0	11.4
part-time	11.1	13.2
Number of transitions	1 210 (73.6%)	947 (68.3%)
of which to full-time	1 066 (88.1%)	776 (81.9%)
to part-time	144 (11.9%)	171 (18.1%)
No. of women	1 645	1 387

<sup>a</sup> 1st birth. <sup>b</sup> 2nd birth. <sup>c</sup> Including censored cases. Reference groups in bold

**Table 2B. Descriptive statistics for variables used in the analysis - Norwegian women**

	First birth		Second birth	
	Full sample	Sub-sample <sup>a</sup>	Full sample	Sub-sample <sup>a</sup>
Maternity leave status:				
Eligible	73.3	72.9	49.1	50.0
<b>Not eligible</b>	26.7	27.1	50.9	50.0
Length of stat. leave				
<b>12 weeks</b>	26.9	30.8	26.9	26.9
18-22 weeks	73.1	69.2	73.1	73.1
Local day-care coverage (%)	10.0	8.9	9.0	8.5
Education:				
<b>Compulsory schooling</b>	13.3	13.6	17.0	16.1
1-3 years gymnasium	63.6	62.1	60.4	60.7
Post-gymnasium educ.	23.1	24.3	22.6	23.2
Work experience (years)	4.7	4.8	5.5	5.5
Prior home-time (months)	2.7	2.9	16.6	16.2
Mother's age at birth				
<b>19-22<sup>b</sup> / 19-24<sup>c</sup></b>	34.7	31.4	24.6	24.1
23-26 <sup>b</sup> / 25-29 <sup>c</sup>	35.1	37.7	50.0	49.9
≥ 27 <sup>b</sup> / ≥ 30 <sup>c</sup>	30.2	30.8	25.4	26.0
Between-birth employment:				
Full-time only			28.4	26.6
Part-time or mixed FT/PT			35.6	37.1
<b>None</b>			36.1	36.3
Age of 1st child (years)			3.6	3.5
National unemployment rate:				
High (≥ 2.1%)	31.6	29.1	32.8	31.7
<b>Low</b>	68.4	70.9	67.2	68.3
Hourly wage (NOK)		83.80		86.10
Partner's ann. inc. (10,000 NOK)		13.60		15.90
Duration: all <sup>d</sup> (months)	15.2	16.3	18.9	19.4
full-time	8.6	9.0	9.9	9.9
part-time	11.0	11.1	12.6	12.7
Number of transitions	903 (66.1%)	654 (66.3%)	631 (55.3%)	548 (57.4%)
of which to full-time	495 (54.8%)	333 (50.9%)	224 (35.5%)	178 (32.5%)
to part-time	408 (45.2%)	321 (49.1%)	407 (64.5%)	370 (67.5%)
No. of women	1 366	986	1 142	954

<sup>a</sup> Women in lasting unions only. <sup>b</sup> 1st birth. <sup>c</sup> 2nd birth. <sup>d</sup> Including censored cases. Reference groups in bold.

**Table 2C. Descriptive statistics for variables used in the analysis - Swedish women**

	First birth		Second birth	
	Full sample	Sub-sample <sup>a</sup>	Full sample	Sub-sample <sup>a</sup>
Maternity leave status:				
On leave	83.8	91.4	80.1	91.9
<b>Not on leave</b>	16.2	8.6	19.9	8.1
Length of stat. leave (months)	11.2	11.3	11.5	11.8
Local day-care coverage (%):	37.6	38.1	38.5	39.9
Education:				
Compulsory schooling	18.0	10.0	18.4	11.7
1-3 years gymnasium	51.6	50.4	54.9	55.0
Post-gymnasium educ.	30.4	39.6	26.7	33.3
Work experience (years)	5.4	6.0	6.3	7.0
Prior home-time (months)	1.1	0.8	6.5	3.1
Mother's age at birth				
<b>19-22<sup>b</sup> / 19-24<sup>c</sup></b>	26.1	16.5	17.1	11.4
23-26 <sup>b</sup> / 25-29 <sup>c</sup>	37.5	37.4	49.7	48.2
≥ 27 <sup>b</sup> / ≥ 30 <sup>c</sup>	36.4	46.1	33.2	40.4
Between-birth employment:				
Full-time only			28.1	28.3
Part-time or mixed FT/PT			52.8	62.1
<b>None</b>			19.1	9.6
Age of 1st child (years)			3.4	3.4
National unemployment rate:				
High (≥ 2.5% <sup>b</sup> / ≥2.6% <sup>c</sup> )	26.2	25.1	17.5	16.8
<b>Low</b>	73.8	74.9	82.5	83.2
Monthly wage (1,000 SEK)		11.4		12.0
Partner's ann. earn. (10,000 SEK)		16.8		18.2
Duration: all <sup>d</sup> (months)	15.7	15.9	17.2	15.8
full-time	14.2	14.2	14.9	14.2
part-time	15.5	15.8	15.1	14.9
Number of transitions	1134 (70.1%)	673 (78.1%)	960 (74.7%)	635 (82.8%)
of which to full-time	445 (39.2%)	234 (34.8%)	297 (30.9%)	164 (21.4%)
to part-time	689 (60.8%)	439 (65.2%)	663 (69.1%)	471 (78.6%)
No. of women	1 618	862	1 285	767

<sup>a</sup> Women with non-missing wage information only. <sup>b</sup> 1st birth. <sup>c</sup> 2nd birth. <sup>d</sup> Including censored cases. Reference groups in bold.

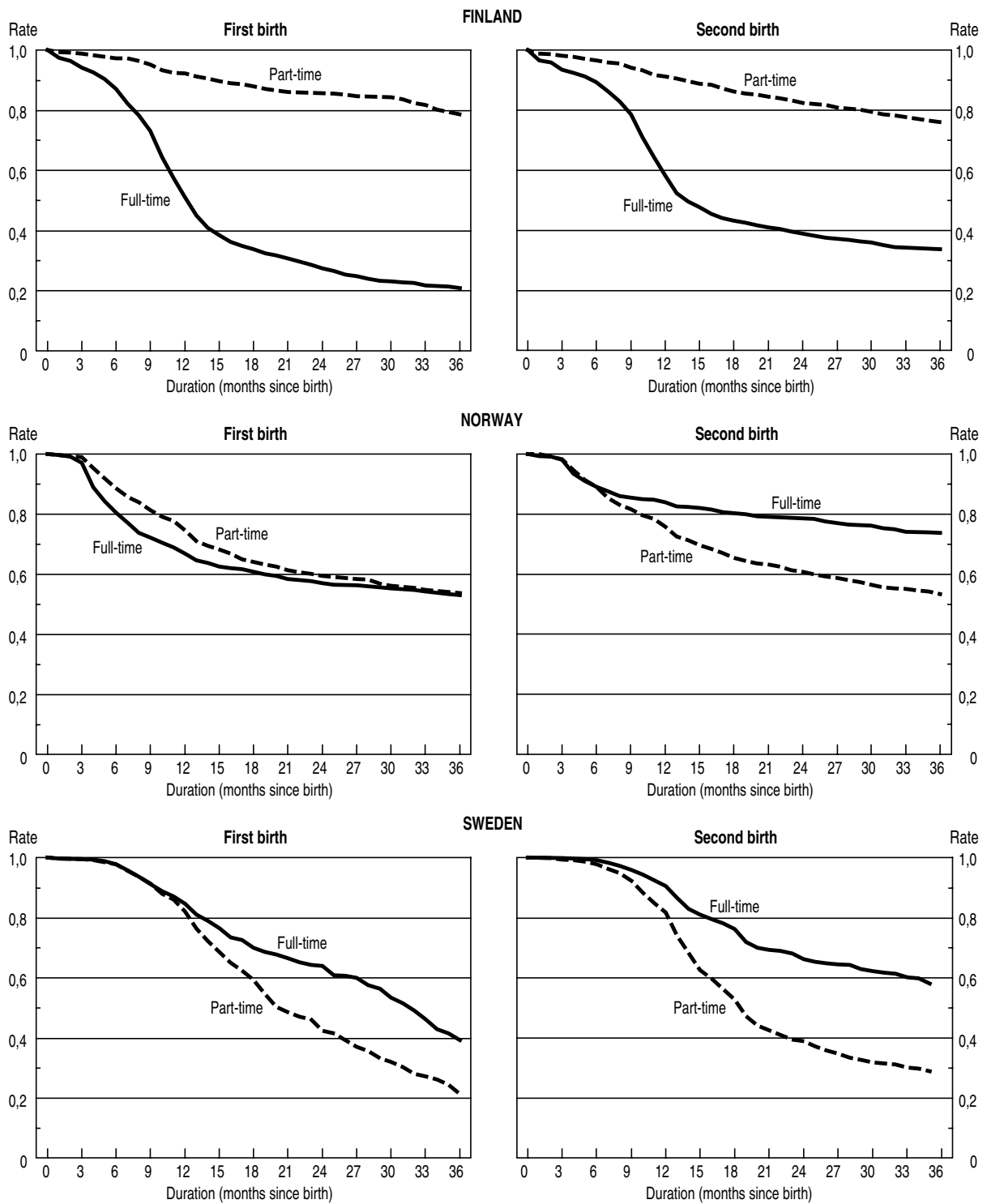
Besides individual and policy-related factors, the full-time and part-time hazards are likely to be influenced by macro-economic conditions and other time trends. In particular we would expect (re)entry rates to be lower during downturns and higher in upturns of the business cycle. In this study the aggregate national *unemployment rate* is used as an indicator of the business cycle. The annual rate is split into two categories, high and low, where for each country ‘high’ corresponds to the upper quartile of the distribution over the years. Together with child care coverage, length of statutory maternity leave and wage and income variables, this picks up most of the time trend in the models. In fact, adding calendar period of child-birth or female birth cohort would only blur the results because of high multicorrelation.

### **4.3. Descriptive statistics and survival functions**

The descriptive statistics of our model covariates for our three full samples and the sub-samples for Norway and Sweden are summarized in Table 2A-C. The statistics for the full samples reveal some important country-differences as well as some dissimilarities between first-time and second-time mothers. First, a smaller proportion of Norwegian mothers are entitled to maternity leave after birth, especially after second birth. Also among Finnish mothers the percentage entitled to leave is lower after second than after first birth, while there is almost no difference between Swedish first and second-time mothers in this respect. Second and consistently, Norwegian mothers are younger and have shorter work experience than Finnish and Swedish mothers. Third and well known, Sweden had the longest average length of statutory leave and highest day-care coverage during the period studied. Fourth, the educational distributions are different: the percentage with only compulsory schooling is highest in the Finnish samples, while the percentage with post-gymnasium education is highest in the Swedish samples. The latter difference is probably due to younger cohorts in the Swedish survey. Fifth, there are considerable cross-country differences in work behavior between the births: no work at all is most common among Norwegian mothers, while only full-time work is most frequent among Finnish mothers and part-time work among Swedish mothers.

Last, but not least, the fraction of mothers who returned to work within 36 months was higher in Finland and Sweden than in Norway at both parities, and while it was slightly higher in Finland than in Sweden after first birth, the relation was the reverse after second birth. Not surprisingly, the proportion of full-time entrants was highest for Finland and the proportion of part-time entrants highest for Sweden. The mean duration of the career break (including censored cases) after first as well as after second birth was shortest for Finland, while it was quite similar for Norway and Sweden after first birth, but longest for Norway after second birth. Further, Norwegian and Finnish mothers who returned to work did so sooner, on average, than Swedish mothers at both parities.

Figure 5. Survival functions of employment entry after first and second birth. Finnish, Norwegian and Swedish women



As mentioned, the sub-samples used in the estimations of wage and income effects for Norway and Sweden are restricted to women whose marriages were intact at the end of 1987 for Norway, and mainly to public sector employees and private sector salaried employees for Sweden. There is very

little difference in composition between the full and reduced samples of Norwegian women, while women in the reduced Swedish samples tend to be older, have longer work experience and to have maternity leave to a greater extent than women in the full samples (Table 2B-C). We return to the issue of possible selectivity bias in the next section.

The survival functions of full-time and part-time employment entry show that in all three countries women tend to be slower to enter employment after the second birth than after the first (Figure 5). A deviation from this pattern is the higher part-time entry rates for second-time mothers in Sweden when the child is between 12 and 30 months old. A possible explanation for this anomaly is the praxis in Swedish public day-care of giving priority to siblings of already enrolled children, which prolongs waiting time for first-borns. Norwegian and Finnish mothers start working earlier than Swedish mothers at both parities, but the cumulative fraction of mothers who enters within 36 months is considerably lower in Norway, especially after second birth, than in Sweden and Finland. Probably, these differences are due to the shorter maternity leave in Norway, which induces a few mothers to return early but makes more mothers leave the labor force. The greater difficulties for new Norwegian mothers to combine paid work and childrearing are likely to have been intensified by the lower supply of subsidized childcare. As expected, Finnish mothers enter full-time work much faster than part-time work at both parities and also at a higher rate than Norwegian and Swedish mothers. By contrast, mothers in Sweden take up part-time work faster than full-time work at both parities and at a higher rate than mothers in the two other countries. Norwegian mothers, on the other hand, enter full-time work more quickly than part-time work after first birth, while after second birth part-time entries occur more quickly than full-time entries.

## 5. Findings

Our main finding is that mothers who have maternity leave generally return to work sooner than mothers who are not entitled both after the first birth and after the second (Model I, Table 3A - C). However, when the entitlement period is prolonged, mothers on leave stay home longer, as expected, so that in all three countries the difference in entry risks between entitled and non-entitled mothers diminishes over time. Further, the time-varying interaction effect is positive and significant for both entries and both parities for the three countries which implies that mothers on leave have a higher risk of re-entry after the leave has expired than during the leave period, as hypothesized.

All this is seen more clearly in Table 4 which displays the total effects on entry risks of leave entitlement and its interaction with leave length and leave expiry. Thus, when the leave period has expired entitled mothers in all countries have a much higher risk of full-time and part-time entry than non-entitled mothers at both parities. This is still true when leave periods are prolonged, except for

part-time entries among Finnish second-time mothers.<sup>17</sup> During the leave period, entitled mothers have much lower entry risks than those not entitled, especially in Finland, but also in Norway after the leave period was prolonged. In Sweden, by contrast, entitled mothers tend to have higher re-entry rates than those not entitled also during the leave period. This is probably due to the greater flexibility of the Swedish program, such as the possibility to save days for later usage, and to the higher propensity of Swedish fathers to use the parental leave.<sup>18</sup> Furthermore, the special Finnish home-care allowance reduces full-time entry, especially after first birth (Table 3A). This finding is in line with Ilmakunnas (1997), who also found a negative effect on female labor supply of the home-care allowance.

In spite of the low overall provision of public day-care in Norway, a higher coverage in the municipality has a positive effect on the full-time hazard of Norwegian first-time mothers. However, the effect decreases with rising provision levels and for second-time mothers the effect is insignificant (Table 3B). Possibly, the day-care coverage in Norway was too low - and the fees too high - to have any positive impact on entry rates after second birth. For Sweden higher levels of child-care provisions have positive and declining, but insignificant, effects on full-time entry among first-time mothers and on part-time entry among second-time mothers (Table 3C).<sup>19</sup>

The most pronounced positive effect of educational level is found for Norway, where higher education clearly speeds up employment entry after the first birth as well as after the second. In Sweden, post-gymnasium education increases the rate of full-time work after the first birth, while mothers with a gymnasium level education have the highest part-time rates; after the second birth the effects of education are small and insignificant. In Finland, by contrast, educational attainment has a greater impact after the second birth than after the first and higher education is seen to speed up part-time entry in particular. Possibly, more educated Finnish women have had broader opportunities to arrange (and perhaps been more able to afford) part-time work as a combination strategy when the child is very young.

---

<sup>17</sup> In addition, the super-risk of full-time entry among entitled Finnish second-time mothers disappears when the paid leave is prolonged beyond seven months. This appears if we fit a model without the interaction with process time and thus obtain the average effect of *leave\* leave length* over the two time intervals (during and after leave).

<sup>18</sup> For information on fathers use of parental leave, see for Finland Mikkola (1992) p.156, for Norway Brandt and Jensberg (1998) and for Sweden Sundström and Stafford (1992) p.208.

<sup>19</sup> The child-care effects become significant when the time-varying interaction term is dropped from the model which indicates that each of these covariates is correlated with time.

**Table 3A. Parameter estimates of full-time and part-time employment entry after 1st and 2nd birth. Finnish women. (Standard errors in parentheses)<sup>a</sup>**

Model I	First birth		Second birth	
	FT	PT	FT	PT
On maternity leave	<b>0.7078</b> (0.1660)	0.0588 (0.4522)	<b>0.3539</b> (0.2113)	0.2555 (0.4505)
On mat.leave*Leave length (months)	<b>-0.1658</b> (0.0187)	<b>-0.0967</b> (0.0506)	<b>-0.1853</b> (0.0226)	<b>-0.2262</b> (0.0517)
On mat.lv*Lv length*After lv expiry	<b>0.2404</b> (0.0146)	<b>0.1652</b> (0.0347)	<b>0.1883</b> (0.0164)	<b>0.1785</b> (0.0333)
Homecare allow. (years)	<b>-0.1875</b> (0.0522)	0.0574 (0.1232)	<b>-0.0766</b> (0.0388)	0.0800 (0.0793)
1-3 years gymnasium	0.0414 (0.0806)	-0.0331 (0.2479)	<b>0.1856</b> (0.0938)	0.1869 (0.2216)
Post-gymnasium education	0.0687 (0.1238)	0.5030 (0.3292)	<b>0.3134</b> (0.1425)	<b>0.7911</b> (0.2967)
Work experience (years)	0.0069 (0.0104)	<b>-0.1147</b> (0.0327)	<b>0.0462</b> (0.0126)	<b>0.0474</b> (0.0274)
Prior home-time (months)	-0.0533 (0.0103)	-0.0993 (0.0346)	-0.0654 (0.0086)	-0.0218 (0.0105)
Mothers age 23-26 <sup>b</sup> / 25-29 <sup>c</sup>	<b>0.1449</b> (0.0873)	0.2614 (0.2418)	<b>-0.2751</b> (0.1153)	0.2265 (0.2610)
Mothers age $\geq 27^b$ / $\geq 30^c$	0.1537 (0.1164)	<b>0.7088</b> (0.3047)	<b>-0.2987</b> (0.1574)	0.3512 (0.3367)
Full-time only between births			<b>0.4280</b> (0.2153)	0.0728 (0.3546)
Part-time or FT/PT between births			-0.3308 (0.2596)	<b>2.0586</b> (0.3559)
Age of 1st child (years)			-0.0037 (0.0150)	<b>-0.0552</b> (0.0323)
High unemployment ( $\geq 5.4\%$ )	-0.0219 (0.0522)	-0.1759 (0.1917)	-0.0809 (0.1110)	-0.0414 (0.2337)
Likelihood ratio	618.3		850.6	
No. of parameters	22		28	
No. of women	1645		1387	

<sup>a</sup> Coeff. in bold: significance level  $\leq 10\%$ . <sup>b</sup> 1st birth. <sup>c</sup> 2nd birth.



**Table 3B. Parameter estimates of full-time and part-time employment entry after 1st and 2nd birth. Norwegian women. (Standard errors in parentheses)<sup>a</sup>**

Model I:	First birth		Second birth	
	FT	PT	FT	PT
Eligible for maternity leave	<b>0.5687</b> (0.1838)	0.2400 (0.1987)	<b>0.9366</b> (0.2796)	0.3087 (0.2068)
Eligible*Long leave (18-22 weeks)	<b>-0.6986</b> (0.1994)	<b>-0.6416</b> (0.2865)	<b>-0.7188</b> (0.2832)	<b>-0.5628</b> (0.2885)
Eligible*Long leave*After leave expiry	<b>0.5898</b> (0.2037)	<b>0.9018</b> (0.2819)	<b>0.7742</b> (0.2934)	<b>0.6826</b> (0.2823)
Day-care coverage (%)	<b>0.0692</b> (0.0202)	0.0101 (0.0217)	-0.0146 (0.0277)	-0.0046 (0.0206)
Day-care coverage <sup>2</sup> /10	<b>-0.0178</b> (0.0062)	-0.0012 (0.0068)	0.0028 (0.0087)	-0.0021 (0.0069)
1-3 years gymnasium	0.0543 (0.1533)	<b>0.5759</b> (0.1953)	0.1341 (0.2172)	0.0642 (0.1584)
Post-gymnasium education	<b>0.3969</b> (0.1941)	<b>1.0585</b> (0.2378)	<b>0.6650</b> (0.2615)	<b>0.4486</b> (0.2029)
Work experience (years)	-0.0017 (0.0213)	-0.0274 (0.0246)	0.0073 (0.0287)	0.0145 (0.0238)
Prior home-time (months)	-0.1293 (0.0268)	-0.0919 (0.0227)	-0.0210 (0.0086)	-0.0262 (0.0057)
Mothers age 23-26 <sup>b</sup> / 25-29 <sup>c</sup>	0.0022 (0.1374)	-0.0459 (0.1482)	-0.3351 (0.2186)	-0.1980 (0.1564)
Mothers age $\geq 27^b$ / $\geq 30^c$	0.2503 (0.1933)	0.1505 (0.2179)	-0.3303 (0.2975)	-0.3442 (0.2357)
Full-time only between births			<b>1.1501</b> (0.3223)	-0.2895 (0.2351)
Part-time or FT/PT between births			<b>-0.7095</b> (0.3619)	<b>0.7588</b> (0.2206)
Age of 1st child (years)			<b>0.0914</b> (0.0320)	<b>0.0728</b> (0.0301)
High unemployment ( $\geq 2.1\%$ )	0.0253 (0.1055)	-0.0689 (0.1185)	0.1094 (0.1566)	0.0114 (0.1175)
Regional dummies	yes	yes	yes	yes
Likelihood ratio		40.8		680.3
No. of parameters		34		38
No. of women		1366		1142

<sup>a</sup> Coeff. in bold: significance level  $\leq 10\%$ . <sup>b</sup> 1st birth. <sup>c</sup> 2nd birth.

**Table 3C. Parameter estimates of full-time and part-time employment entry after 1st and 2nd birth. Swedish women. (Standard errors in parentheses)<sup>a</sup>**

Model I:	First birth		Second birth	
	FT	PT	FT	PT
On maternity leave	<b>1.3460</b> (0.3576)	<b>1.0988</b> (0.2913)	<b>0.9797</b> (0.4583)	<b>0.6646</b> (0.3403)
On mat leave*Leave length (months)	<b>-0.0912</b> (0.0282)	<b>-0.0532</b> (0.0234)	<b>-0.0782</b> (0.0349)	-0.0331 (0.0252)
On mat lv*Lv length*After lv expiry	<b>0.0621</b> (0.0155)	<b>0.0588</b> (0.0126)	<b>0.0660</b> (0.0176)	<b>0.0833</b> (0.0122)
Day-care coverage (%)	0.0236 (0.0162)	-0.0098 (0.0129)	0.0015 (0.0219)	0.0200 (0.0157)
Day-care coverage <sup>2</sup> /100	-0.0238 (0.0210)	0.0045 (0.0168)	0.0154 (0.0284)	-0.0250 (0.0200)
1-3 years gymnasium	-0.0276 (0.1364)	<b>0.3386</b> (0.1141)	-0.1201 (0.1641)	0.0805 (0.1148)
Post-gymnasium education	<b>0.3495</b> (0.1595)	0.1429 (0.1367)	0.0807 (0.1950)	0.1735 (0.1391)
Work experience (years)	-0.0162 (0.0213)	-0.0174 (0.0169)	0.0025 (0.0239)	0.0180 (0.0163)
Prior home-time (months)	-0.0163 <b>-0.0195</b> (0.0200)	<b>-0.0419</b> (0.0196)	(0.0096)	<b>-0.0392</b> (0.0082)
Mothers age 23-26 <sup>b</sup> / 25-29 <sup>c</sup>	-0.0533 -0.1659 (0.1428)	<b>0.2921</b> (0.1175)	(0.1850)	0.1042 (0.1289)
Mothers age $\geq 27^b$ / $\geq 30^c$	-0.1669 (0.1937)	<b>0.3184</b> (0.1570)	0.0518 (0.2516)	<b>-0.3574</b> (0.1741)
Full-time only between births			<b>0.4124</b> (0.2414)	-0.1678 (0.2284)
Part-time or FT/PT between births			<b>-1.3641</b> (0.2691)	<b>0.7941</b> (0.2209)
Age of 1st child (years)			<b>0.0568</b> (0.0295)	<b>-0.0336</b> (0.0227)
High unemployment ( $\geq 2.5\%^b/2.6\%^c$ )	<b>-0.5466</b> (0.1296)	<b>-0.5428</b> (0.1008)	<b>-0.4159</b> (0.2344)	-0.0235 (0.1336)
Regional dummies	yes	yes	yes	yes
Likelihood ratio	301.8		695.4	
No. of parameters	28		34	
No. of women	1 618		1 285	

<sup>a</sup> Coeff. in bold: significance level  $\leq 10\%$ . <sup>b</sup>1st birth. <sup>c</sup>2nd birth.

**Table 4. Risks of employment entry for mothers entitled to parental leave relative to non-entitled mothers (risk = 1) during leave and after leave expiry for different lengths of paid parental leave**

Months of paid leave	FINLAND				NORWAY				SWEDEN			
	During leave		After leave		During leave		After leave		During leave		After leave	
	FT	PT	FT	PT	FT	PT	FT	PT	FT	PT	FT	PT
<b>First birth</b>												
3	1.23	0.79	2.54	1.30	1.77	1.27	3.19	3.13				
4	1.04	0.72	2.74	1.39	0.88	0.67	1.58	1.65				
6	0.75	0.59	3.18	1.60					2.22	2.18	3.23	3.10
7	0.64	0.54	3.42	1.71					2.03	2.07	3.13	3.12
8	0.54	0.49	3.69	1.83					1.85	1.96	3.04	3.13
9	0.46	0.44	3.97	1.96					1.69	1.86	2.96	3.16
10	0.39	0.40	4.28	2.10					1.54	1.76	2.87	3.17
12									1.29	1.58	2.71	3.21
15									0.98	1.35	2.48	3.26
<b>Second birth</b>												
3	0.82	0.66	1.44	1.12	2.55	1.36	5.53	2.69				
4	0.68	0.52	1.44	1.07	1.24	0.78	2.67	1.53				
6	0.47	0.33	1.45	0.97					1.67	1.59	2.48	2.63
7	0.39	0.27	1.45	0.92					1.54	1.54	2.45	2.76
8	0.32	0.21	1.46	0.88					1.42	1.49	2.42	2.90
9	0.27	0.17	1.46	0.84					1.32	1.44	2.39	3.05
10	0.22	0.13	1.47	0.80					1.22	1.40	2.36	3.21
12									1.04	1.31	2.30	3.30
15									0.82	1.18	2.22	4.13

Note: The relative risks have been calculated on the basis of the estimates in Table 3A-C and for different months of parental leave chosen for comparative purposes. The months are within the range of the actual statutory leaves during 1972-90, but may not necessarily correspond to the exact lengths in each country. This especially concerns Finland where parental leave is stipulated in days, while for Sweden the only never-existing leave periods are 8 and 10 months. For Norway the estimates for 3 and 4 months refer to 12 and 18-22 weeks, respectively.

In line with previous research, months spent at home prior to birth is negatively associated with employment entry at both parities in all three countries. This is as expected, since mothers who stay at home longer prior to birth are likely to value their time at home higher and to have weaker ties with the labor market as well as greater difficulties in finding a job after birth than those who work longer into pregnancy (Joesch, 1994). Longer work experience, on the other hand, only affects the entry rates of Finnish mothers, among whom it speeds up employment in general after second birth and delays part-time entry after first birth.

Consistent with the finding by Shaw (1994) for young American women, we find a considerable persistence in work behavior, including preferred hours of work. The effects are similar in all three countries: mothers who worked only full time between births are much more likely to enter full-time

work after the second birth than those who did not work at all or who worked part time for some time between births. The latter group is, in turn, much more likely to enter part-time work. Another important determinant of employment entry after the second birth is, as expected, the age of the first child. The effect is particularly strong for Norwegian mothers among whom both full-time and part-time entries increase with age of the first child. Finnish and Swedish mothers, by contrast, tend to choose part-time work if the children are closer in age and full-time work if the age difference is larger. An interpretation of these differences, which is consistent with the survival curves, is that the labor supply of Norwegian mothers is more sensitive to the child's age.

Interestingly, we find that high unemployment has a strong negative and significant impact on the entry rates of Swedish mothers only, among whom all entry rates are affected except part-time entries after the second birth. Possible reasons for why Sweden differ in this respect are its lower percentages of self-employed and employed family members, its higher unionization as well as greater emphasis on seniority.<sup>20</sup>

Let us now turn to the effects of the woman's wage and her partner's income (Model II). As discussed in Section 4, these models are estimated on sub-samples, because data on wages and partner's income are not available for the full samples. To check if this introduces bias, we have re-estimated model I on the sub-samples (see Appendix Table 1 and 2). Since the resulting estimates are qualitatively very similar to those in Table 3B-C, although generally less significant, we feel that selectivity bias is not a major problem here.

Examining the results in Table 5B-C, we find the expected positive effects of own wage on full-time and part-time entries among Norwegian women. The estimates are highly significant both after the first birth and after the second. For Sweden there is a strong positive effect on full-time entry after the first birth, while after the second there is a significant effect on part-time entry, which is positive only for above average wages. Partner's income has the expected negative effect for Norway while for Sweden the effect is small and insignificant. The latter result is, in fact, consistent with previous findings of small effects of spouse's income on female labor supply in Sweden (see e.g. Sundström, 1987). As this variable is not available for Finland we have included partner's education as a proxy for earnings (Table 5A). Interestingly, there is an indication of a substantial income effect for Finland as full-time rates are considerably reduced for mothers with a more educated spouse. One possible explanation for these intriguing country-differences in effects of partner's income is the earlier and

---

<sup>20</sup> The fact that the interaction between mother's age and high unemployment was significant suggests that emphasis on seniority combined with high unionization might be important, since unions will follow the rule of last-in-first-out, which, in turn, will disfavor the young.

**Table 5A. Parameter estimates of full-time and part-time employment entry after 1st and 2nd birth. Finnish women. (Standard errors in parentheses)<sup>a</sup>**

Model II	First birth		Second birth	
	FT	PT	FT	PT
On maternity leave	<b>0.6831</b> (0.1664)	0.0566 (0.4527)	0.3307 (0.2116)	0.2658 (0.4522)
On mat.leave*Leave length (months)	<b>-0.1645</b> (0.0187)	<b>-0.0967</b> (0.0506)	<b>-0.1834</b> (0.0226)	<b>-0.2263</b> (0.0519)
On mat.lv*Lv length*After lv expiry	<b>0.2408</b> (0.0146)	<b>0.1653</b> (0.0347)	<b>0.1884</b> (0.0164)	<b>0.1780</b> (0.0333)
Homecare allow. (years)	<b>-0.1832</b> (0.0522)	0.0583 (0.1235)	<b>-0.0740</b> (0.0388)	0.0845 (0.0796)
1-3 years gymnasium	0.0524 (0.0807)	-0.0316 (0.2482)	<b>0.1908</b> (0.0938)	0.1826 (0.2219)
Post-gymnasium education	0.1372 (0.1269)	0.5101 (0.3350)	<b>0.4226</b> (0.1463)	<b>0.7108</b> (0.3076)
Work experience (years)	0.0023 (0.0106)	<b>-0.1155</b> (0.0335)	<b>0.0419</b> (0.0127)	<b>0.0524</b> (0.0277)
Prior home-time (months)	-0.0547 (0.0104)	-0.0996 (0.0347)	-0.0663 (0.0086)	-0.0214 (0.0105)
Mothers age 23-26 <sup>b</sup> / 25-29 <sup>c</sup>	<b>0.1728</b> (0.0881)	0.2659 (0.2450)	<b>-0.2316</b> (0.1161)	0.1906 (0.2640)
Mothers age $\geq 27^b$ / $\geq 30^c$	<b>0.2056</b> (0.1185)	<b>0.7170</b> (0.3128)	-0.2343 (0.1592)	0.2795 (0.3439)
Full-time only between births			<b>0.4033</b> (0.2160)	0.0803 (0.3540)
Part-time or FT/PT between births			-0.3369 (0.2600)	<b>2.0586</b> (0.3556)
Age of 1st child (years)			-0.0052 (0.0152)	-0.0523 (0.0324)
High unemployment ( $\geq 5.4\%$ )	-0.0262 (0.0684)	-0.1758 (0.1917)	-0.0716 (0.1110)	-0.0413 (0.2337)
Partner's education $\geq$ gymn.level	<b>-0.2012</b> (0.0820)	-0.0234 (0.2020)	<b>-0.3305</b> (0.1047)	0.1903 (0.1974)
Likelihood ratio	624.5		862.0	
No. of parameters	24		30	
No. of women	1 645		1 387	

<sup>a</sup> Coeff. in bold: significance level  $\leq 10\%$ . <sup>b</sup> 1st birth. <sup>c</sup> 2nd birth.

**Table 5B. Parameter estimates of full-time and part-time employment entry after 1st and 2nd birth. Norwegian women. (Standard errors in parentheses)<sup>a</sup>**

Model II <sup>b</sup>	First birth		Second birth	
	FT	PT	FT	PT
Eligible for maternity leave	<b>0.7015</b> (0.2194)	0.1611 (0.2195)	<b>1.3738</b> (0.3437)	<b>0.4180</b> (0.2242)
Eligible*Long leave (18-22 weeks)	<b>-1.0434</b> (0.2553)	<b>-0.9145</b> (0.3360)	<b>-1.0890</b> (0.3423)	<b>-0.8084</b> (0.3151)
Eligible*Long leave*After leave expiry	<b>0.7707</b> (0.2476)	<b>0.9057</b> (0.3210)	<b>0.8586</b> (0.3323)	<b>0.6113</b> (0.2962)
Day-care coverage (%)	<b>0.0548</b> (0.0254)	-0.0205 (0.0250)	-0.0428 (0.0322)	-0.0219 (0.0221)
Day-care coverage <sup>2</sup> /10	<b>-0.0177</b> (0.0080)	0.0036 (0.0079)	0.0100 (0.0099)	0.0015 (0.0074)
1-3 years gymnasium	-0.2076 (0.1952)	0.2943 (0.2397)	-0.2253 (0.2546)	-0.0414 (0.1779)
Post-gymnasium education	-0.1722 (0.3067)	0.4209 (0.3352)	-0.0256 (0.4055)	0.0955 (0.2784)
Work experience (years)	-0.0089 (0.0268)	-0.0269 (0.0282)	0.0149 (0.0324)	0.0223 (0.0245)
Prior home-time (months)	-0.0916 (0.0278)	-0.1345 (0.0292)	-0.0161 (0.0094)	-0.0252 (0.0058)
Mothers age 23-26 <sup>c</sup> / 25-29 <sup>d</sup>	-0.0430 (0.1714)	-0.0873 (0.1707)	<b>-0.4530</b> (0.2519)	-0.1744 (0.1669)
Mothers age $\geq 27^c$ / $\geq 30^d$	0.1909 (0.2520)	-0.0879 (0.2626)	<b>-0.5854</b> (0.3443)	-0.3708 (0.2513)
Full-time only between births			<b>1.0237</b> (0.3741)	<b>-0.4307</b> (0.2500)
Part-time or FT/PT between births			<b>-1.1328</b> (0.4250)	<b>0.7401</b> (0.2309)
Age of 1st child (years)			<b>0.0804</b> (0.0369)	<b>0.0865</b> (0.0329)
High unemployment ( $\geq 2.1\%$ )	-0.1031 (0.1358)	-0.0750 (0.1366)	0.0289 (0.1753)	0.0503 (0.1214)
Hourly wage (NOK)	<b>0.0183</b> (0.0075)	<b>0.0265</b> (0.0078)	<b>0.0277</b> (0.0098)	<b>0.0174</b> (0.0067)
Partner's income (10,000 NOK)	<b>-0.0185</b> (0.0091)	-0.0053 (0.0088)	<b>-0.0236</b> (0.0139)	<b>-0.0251</b> (0.0090)
Regional dummies	yes	yes	yes	yes
Likelihood ratio	269.6		609.4	
No. of parameters	38		42	
No. of women	986		954	

<sup>a</sup>Coeff. in bold: significance level  $\leq 10\%$ . <sup>b</sup>Sub-sample: women in lasting unions only. <sup>c</sup>1st birth. <sup>d</sup>2nd birth.

**Table 5C. Parameter estimates of full-time and part-time employment entry after 1st and 2nd birth. Swedish women. (Standard errors in parentheses)<sup>a</sup>**

Model II	First birth		Second birth	
	FT	PT	FT	PT
On maternity leave	<b>1.2654</b> (0.5781)	<b>1.0533</b> (0.4250)	0.6817 (0.7837)	0.5888 (0.4582)
On mat leave*Leave length (months)	<b>-0.0967</b> (0.0419)	<b>-0.0553</b> (0.0318)	-0.0325 (0.0527)	<b>-0.0611</b> (0.0319)
On mat lv*Lv length*After lv expiry	<b>0.0600</b> (0.0221)	<b>0.0366</b> (0.0161)	<b>0.0834</b> (0.0250)	<b>0.0813</b> (0.0149)
Day-care coverage (%)	-0.0137 (0.0254)	<b>-0.0392</b> (0.0191)	-0.0121 (0.0369)	-0.0037 (0.0210)
Day-care coverage <sup>2</sup> /100	0.0310 (0.0318)	<b>0.0399</b> (0.0239)	0.0318 (0.0457)	0.0085 (0.0261)
1-3 years gymnasium	0.1200 (0.2524)	0.2667 (0.1786)	-0.1776 (0.2683)	0.0255 (0.1586)
Post-gymnasium education	0.4080 (0.2698)	-0.0085 (0.1970)	0.1321 (0.3096)	0.0951 (0.1881)
Work experience (years)	-0.0199 (0.0286)	-0.0344 (0.0213)	0.0254 (0.0334)	0.0163 (0.0199)
Prior home-time (months)	-0.0200 (0.0386)	-0.0005 (0.0273)	<b>-0.0416</b> (0.0211)	<b>-0.0423</b> (0.0176)
Mothers age 23-26 <sup>b</sup> / 25-29 <sup>c</sup>	<b>-0.4058</b> (0.2190)	<b>0.2970</b> (0.1673)	0.3941 (0.3508)	-0.2119 (0.1632)
Mothers age $\geq 27^b$ / $\geq 30^c$	<b>-0.6261</b> (0.2840)	0.2969 (0.2128)	-0.0065 (0.4343)	<b>-0.3836</b> (0.2239)
Full-time only between births			0.4153 (0.4478)	-0.4754 (0.3694)
Part-time or FT/PT between births			<b>-1.5625</b> (0.4765)	0.3626 (0.3634)
Age of 1st child (years)			0.0660 (0.0445)	-0.0430 (0.0299)
High unemployment (2.5% <sup>b</sup> /2.6% <sup>c</sup> )	<b>-0.7249</b> (0.1831)	<b>-0.3826</b> (0.1203)	-0.4840 (0.3114)	0.0723 (0.1606)
Monthly wage (1,000 SEK)	<b>0.1091</b> (0.0344)	0.0202 (0.0271)	-0.0842 (0.2128)	<b>-0.1702</b> (0.1007)
Monthly wage squared	0.0046 (0.0077)	<b>0.0082</b> (0.0041)		
Partner's annual earnings (10,000 SEK)	0.0013 (0.0255)	0.0301 (0.0222)	0.0049 (0.0131)	-0.0060 (0.0076)
Partner's earnings squared/100	-0.0074 (0.0574)	-0.0732 (0.0557)		
Regional dummies	yes	yes	yes	yes
Likelihood ratio		147.8		341.8
No. of parameters		34		40
No. of women		862		767

<sup>a</sup> Coeff. in bold: significance level  $\leq 10\%$ . <sup>b</sup> Sub-sample: <sup>c</sup> 1st birth. <sup>d</sup> 2nd birth.

higher degree of individualization of tax and social security systems in Sweden, which gave married and cohabiting women strong incentives to work for pay regardless of spouse's income.<sup>21</sup> Finally, comparing Model I and II for the sub-samples (Appendix Table A1-A2 and Table 5B-C), we see that the positive effects of leave entitlement and leave expiry that were significant in model I remain after the inclusion of own wage and spouse's income, as do the negative effects of longer entitlements. But, as expected, the effects of education are no longer significant. Thus, the positive entry effects of leave entitlement cannot be explained by higher earning mothers being disproportionately more entitled to leave.

## 6. Summary and discussion

In this paper we compare the employment patterns of women after first and second birth in three Nordic countries – Sweden, Norway and Finland - during 1972-92. These countries have longstanding parental-leave and subsidized day-care programs, the aims of which are to facilitate the employment of mothers. The parental leave programs in the Nordic countries have many similarities, but there have been important differences in generosity and flexibility over the period studied. For example, the length of the paid leave varied from 12 weeks in Finland and Norway at the start of our study period to 15 months in Sweden at the end, while the day-care coverage rates rose from 5-10 to 40-50 percent. We use these contrasts to analyze the impact of family policies on the timing of mothers' full-time and part-time work following the first as well as the second birth.

A general finding for the three countries is that women who are entitled to paid leave have a much higher overall employment risk than non-eligible women. However, as women tend to use their full leave entitlement, the super-risk is limited largely to the after-leave period, except in Sweden where entitled mothers have an elevated risk also during the leave period. This suggests that mothers in Sweden make use of its more flexible provisions to take leave part time or save days for later usage. Further, as the statutory leave is prolonged, entitled mothers in all countries stay home longer, so that their entry risk relative to non-entitled mothers diminishes over time. In fact, in Finland the super-risk of entitled second-time mothers vanishes when the leave is about seven months, and when the leave becomes even longer, non-entitled mothers have the highest entry rates. In Sweden, where entitled mothers had a higher risk at the outset, and in Norway, where the extensions were few and small, entitled mothers still have higher overall employment risks at the end of our study period.

---

<sup>21</sup> For example, Aaberge et al. (1990) found in a simulation that if the Norwegian tax system was applied in Sweden, labor force participation and hours worked by Swedish women would be substantially reduced.



Increases in the local supply of subsidized day-care seem also to have encouraged employment entry. In Norway the effect is limited to first-time mothers and declines with rising coverage levels, whereas for Sweden the results points to similar effects on full-time entry among first-time mothers and on part-time entry among second-time mothers. Since the coverage rate was much lower in Norway than in Sweden throughout the period studied, this could imply that a relatively high coverage level is needed to make an impact among second-time mothers. For Finland, information on local day-care supply is not available, but an important finding is the significant negative effect on full-time entries of the unique home-care allowance system of that country.

Our results show that public policies do shape women's after-birth employment behavior. A generous parental leave program, such as the Swedish, will encourage more mothers to work up eligibility for leave and to remain in the labor market throughout the childbearing years. With a shorter entitlement, such as that in Norway during the period studied, some women will resume employment sooner, but a larger number will end up outside the labor force, since it is more difficult to reconcile paid work and motherhood when the baby is very young. However, our results also indicate that a very generous leave may prolong women's career breaks, as mothers who are entitled to leave will make use of the opportunity to stay home longer. Hence, parental-leave extensions and child-minding benefit programs like the Finnish home-care allowance scheme could have negative consequences for women's careers and earnings potentials and may preserve an unequal division of labor in the family.

## References

- Aaberge, R., J. Dagsvik and S. Strøm (1990): Skatt og arbeidstilbud i Sverige (Taxes and labor supply in Sweden), *Økonomisk debatt* **18**, 51-55.
- Albrecht J.W., P.A. Edin, M. Sundström and S.B. Vroman (1999): Career interruptions and subsequent earnings: A reexamination using Swedish data, *Journal of Human Resources* **34**, 294-311.
- Brandth, B. and J. Jensberg (1998): Suksess for fedrekvoten (Success for the fathers' quota), *Velferd* No. 4.
- Cox, D.R.(1972): Regression models and life-tables (with discussion), *Journal of the Royal Statistical Society* **B 34**, 187-220.
- Eurostat (1995): Women and men in the European Union. A statistical portrait, Luxembourg.
- Even, W.E. (1987): Career interruptions following childbirth, *Journal of Labor Economics* **5**, 255-277.
- Gronau, R. (1988): Sex-related wage differentials and women's interrupted labor careers - the chicken or the egg, *Journal of Labor Economics* **6**, 277-301.
- Gustafsson, S.S. and F. Stafford (1994): "Three regimes of child care", in: R. Blank (ed): *Social protection versus economic flexibility: Is there a tradeoff?*, Chicago: University of Chicago Press, 333-361.
- Hoem, B. (1995): Kvinnors och mäns liv.Del 1 Sysselsättning från 18 års ålder, Statistics Sweden, Stockholm.
- Hoem, J.M. (1993): Public policy as the fuel of fertility, *Acta Sociologica* **36**, 19-31.
- Hotz, J.V. and R.A. Miller (1988): An empirical analysis of life cycle fertility and female labor supply, *Econometrica* **56**, 91-118.
- Ilmakunnas, S. (1997): "Public policy and child care choice", in: I. Persson and C. Jonung (eds): *Economics of Family and Family Policy*, Routledge, London, 178-93.
- Joesch, J.M.(1994): Children and the timing of women's paid work after childbirth, *Journal of Marriage and the Family* **56**, 429-440.
- Joesch, J.M. (1997): Paid leave and the timing of women's employment before and after childbirth, *Journal of Marriage and the Family* **59**, 1008-10021.
- Jonsson, J. O. and C. Mills (1998): Giving birth without giving up, Paper presented to the World Congress of Sociology, Montreal, July
- Klerman, J.A. and A. Leibowitz (1999): Job continuity among new mothers, *Demography* **36**, 145-155.
- Kravdal, Ø. (1992a): The weak impact of female labour-force participation on Norwegian third-birth rates, *European Journal of Population* **8**, 247-263.
- Kravdal, Ø. (1992b): Foregone labor participation and earning due to childbearing among Norwegian women, *Demography* **29**, 545-563.

- Leibowitz, A., Klerman, J.A. and L.J. Waite (1992): Employment of new mothers and child care choice, *Journal of Human Resources* **27**, 112-133.
- Mikkola, M. (1991): "Finland: Supporting parental choice", in: Kamerman, S.B. and A. J. Kahn (eds): *Child care, parental leave, and the under 3s*, Auburn house, Westport CT, 145-170.
- Nordic Council of Ministers (1995): Yearbook of Nordic statistics, Copenhagen.
- Nätti, J. (1995): Part-time work in the Nordic countries: A trap for women? *Labour* **9**, 343-357.
- Ondrich, J., C.K. Spiess and Q. Yang (1996): Barefoot in a German kitchen: Federal parental leave and benefit policy and the return to work after childbirth in Germany, *Journal of Population Economics* **9**, 247-266.
- Ondrich, J., C.K. Spiess, Q. Yang and G.G. Wagner (1998): Full time or part time? German parental leave policy and the return to work after childbirth in Germany, Paper presented to the 12<sup>th</sup> Annual meeting of the European Society for Population Economics (ESPE), Amsterdam, June.
- Pfau-Effinger, B. (1993): Modernisation, culture and part-time employment: The example of Finland and West Germany, *Work, Employment and Society* **7**, 383-410.
- Ruhm, C.J. (1998): The economic consequences of parental leave mandates, *Quarterly Journal of Economics* **113**, 285-317.
- Rønsen, M. and M. Sundström (1996): Maternal employment in Scandinavia, *Journal of Population Economics* **9**, 267-285.
- Salmi, M. (1994): The parental leave and day care systems in Finland, National Research and Development Centre for Welfare and Health (STAKES), Helsinki.
- Shapiro, D. and F.L. Mott (1994): Long-term employment and earnings of women in relation to employment behavior surrounding the first birth, *Journal of Human Resources* **29**, 248-75.
- Shaw, K. (1994): The persistence of female labor supply, *Journal of Human Resources* **29**, 348-78.
- Sundström, M. (1987): A study in the growth of part-time work in Sweden, Arbetslivscentrum, Stockholm.
- Sundström, M. and F.P. Stafford (1992): Female labour force participation, fertility and public policy in Sweden, *European Journal of Population* **8**, 199-215.

**Table A1. Parameter estimates for Model I estimated on reduced samples for Norway.**  
(Standard errors in parentheses)<sup>a</sup>

	First birth		Second birth	
	FT	PT	FT	PT
Eligible for maternity leave	<b>0.5837</b> (0.2132)	0.0307 (0.2129)	<b>1.1100</b> (0.3201)	0.3252 (0.2195)
Eligible*Long leave (18-22 weeks)	<b>-0.8318</b> (0.2381)	<b>-0.5899</b> (0.3227)	<b>-0.7743</b> (0.3158)	<b>-0.5871</b> (0.3034)
Eligible*Long leave*After leave expiry	<b>0.7632</b> (0.2476)	<b>0.8926</b> (0.3211)	<b>0.8739</b> (0.3314)	<b>0.5709</b> (0.2957)
Day-care coverage (%)	<b>0.0693</b> (0.0245)	0.0017 (0.0242)	-0.0197 (0.0309)	-0.0083 (0.0216)
Day-care coverage <sup>2</sup> /10	<b>-0.0206</b> (0.0078)	-0.0011 (0.0077)	0.0050 (0.0096)	-0.0013 (0.0073)
1-3 years gymnasium	-0.0611 (0.1834)	<b>0.5214</b> (0.2292)	-0.0132 (0.2421)	0.0717 (0.1682)
Post-gymnasium education	0.2584 (0.2382)	<b>1.0572</b> (0.2754)	<b>0.6711</b> (0.2917)	<b>0.4549</b> (0.2134)
Work experience (years)	-0.0079 (0.0272)	-0.0227 (0.0287)	0.0276 (0.0323)	0.0275 (0.0247)
Prior home-time (months)	-0.0937 (0.0277)	-0.1302 (0.0289)	-0.0164 (0.0095)	-0.0256 (0.0059)
Mothers age 23-26 <sup>b</sup> / 25-29 <sup>c</sup>	0.0037 (0.1711)	0.0062 (0.1699)	-0.3902 (0.2482)	-0.1643 (0.1646)
Mothers age $\geq 27^b$ / $\geq 30^c$	0.3190 (0.2445)	0.1559 (0.2529)	-0.4488 (0.3338)	-0.3440 (0.2437)
FT only between births			<b>1.0617</b> (0.3703)	<b>-0.4402</b> (0.2503)
PT or FT/PT between births			<b>-1.0424</b> (0.4203)	<b>0.7460</b> (0.2304)
Age of 1st child (years)			<b>0.0837</b> (0.0365)	<b>0.0879</b> (0.0331)
High unemployment ( $\geq 2.1\%$ )	-0.1460 (0.1358)	-0.1075 (0.1370)	0.0387 (0.1786)	0.0531 (0.1219)
Regional dummies	yes	yes	yes	yes
Likelihood ratio		249.0		585.5
No. of parameters		34		38
No. of women		986		954

<sup>a</sup> Coeff. in bold: significance level  $\leq 10\%$ . <sup>b</sup>1st birth. <sup>c</sup> 2nd birth.

**Table A2. Parameter estimates for Model I estimated on reduced samples for Sweden.  
(Standard errors in parentheses)<sup>a</sup>**

Model I:	First birth		Second birth	
	FT	PT	FT	PT
On maternity leave	<b>1.1730</b> (0.5769)	<b>0.9825</b> (0.4207)	0.6883 (0.7754)	0.5361 (0.4530)
On mat leave*Leave length (months)	<b>-0.0842</b> (0.0420)	-0.0501 (0.0314)	-0.0314 (0.0522)	<b>-0.0575</b> (0.0317)
On mat lv*Lv length*After lv expiry	<b>0.0604</b> (0.0223)	<b>0.0376</b> (0.0161)	<b>0.0823</b> (0.0251)	<b>0.0817</b> (0.0149)
Day-care coverage (%)	-0.0145 (0.0254)	<b>-0.0401</b> (0.0190)	-0.0128 (0.0368)	-0.0068 (0.0209)
Day-care coverage <sup>2</sup> /100	0.0299 (0.0317)	<b>0.0398</b> (0.0238)	0.0326 (0.0456)	0.0113 (0.0260)
1-3 years gymnasium	0.1341 (0.2517)	0.2770 (0.1782)	-0.1677 (0.2674)	0.0080 (0.1574)
Post-gymnasium education	<b>0.5239</b> (0.2654)	0.0164 (0.1931)	0.1819 (0.3018)	0.1000 (0.1834)
Work experience (years)	-0.0191 (0.0284)	-0.0313 (0.0210)	0.0237 (0.0331)	0.0146 (0.0199)
Prior home-time (months)	-0.0276 (0.0389)	-0.0005 (0.0272)	<b>-0.0415</b> (0.0211)	<b>-0.0414</b> (0.0174)
Mothers age 23-26 <sup>b</sup> / 25-29 <sup>c</sup>	-0.2518 (0.2129)	<b>0.3217</b> (0.1629)	0.4143 (0.3480)	-0.2043 (0.1617)
Mothers age $\geq 27^b$ / $\geq 30^c$	-0.3400 (0.2636)	<b>0.3451</b> (0.1992)	0.0745 (0.4219)	-0.3477 (0.2157)
Full-time only between births			0.4149 (0.4463)	-0.4853 (0.3632)
Part-time or FT/PT between births			<b>-1.5585</b> (0.4740)	0.3509 (0.3569)
Age of 1st child (years)			0.0654 (0.0442)	-0.0394 (0.0296)
High unemployment (2.5% <sup>b</sup> /2.6% <sup>c</sup> )	<b>-0.7389</b> (0.1824)	<b>-0.3921</b> (0.1194)	-0.4594 (0.3089)	0.0802 (0.1596)
Regional dummies	yes	yes	yes	yes
Likelihood ratio		135.0		336.4
No. of parameters		28		34
No. of women		862		767

<sup>a</sup> Coeff. in bold: significance level  $\leq 10\%$ . <sup>b</sup>1st birth. <sup>c</sup>2nd birth.

## Recent publications in the series Discussion Papers

- 169 K. Nyborg (1996): Some Norwegian Politicians' Use of Cost-Benefit Analysis
- 170 E. Berg, S. Kverndokk and K. E. Rosendahl (1996): Market Power, International CO<sub>2</sub> Taxation and Petroleum Wealth
- 171 R. Aaberge, U. Colombino and S. Strøm (1996): Welfare Effects of Proportional Taxation: Empirical Evidence from Italy, Norway and Sweden
- 172 J.K. Dagsvik (1996): Dynamic Choice, Multistate Duration Models and Stochastic Structure
- 173 J.K. Dagsvik (1996): Aggregation in Matching Markets
- 174 H.C. Bjørnland (1996): The Dynamic Effects of Aggregate Demand, Supply and Oil Price Shocks
- 175 A. Bruvoll and K. Ibenholt (1996): Future Waste Generation. Forecasts Based on a Macroeconomic Model
- 176 T. Fæhn and L. A. Grünfeld (1996) Recent Leaps Towards Free Trade. The Impact on Norwegian Industry and Trade Patterns
- 177 R. Barrell and K. A. Magnussen (1996): Counterfactual Analyses of Oil price Shocks using a World Model
- 178 E. Bowitz and S. I. Hove (1996): Business cycles and fiscal policy: Norway 1973-93
- 179 H.C. Bjørnland (1996): Sources of Business Cycles in Energy Producing Economies: The case of Norway and United Kingdom
- 180 K. Nyborg (1996): The Political Man and Contingent Valuation: Motives Do Count
- 181 E. Berg, S. Kverndokk and K.E. Rosendahl (1996): Gains from Cartelisation in the Oil Market
- 182 R. Aaberge and I. Aslaksen (1996): Decomposition of the Gini Coefficient by Income Components: Various Types of Applications and Interpretations
- 183 B. Bye (1996): Taxation, Unemployment and Growth: Dynamic Welfare Effects of "Green" Policies
- 184 T.J. Klette and F. Johansen (1996): Accumulation of R&D Capital and Dynamic Firm Performance: A Not-so-fixed Effect Model
- 185 B. Bye (1996): Environmental Tax Reform and Producer Foresight: An Intertemporal Computable General Equilibrium Analysis
- 186 S. Grepperud (1997): Soil Depletion Choices under Production and Price Uncertainty
- 187 N.M. Stølen and T. Åvitsland (1997): Has Growth in Supply of Educated Persons Been Important for the Composition of Employment?
- 188 T.J. Klette and Z. Griliches (1997): Empirical Patterns of Firm Growth and R&D Investment: A Quality Ladder Model Interpretation
- 189 J. Aune, S. Glomsrød, V. Iversen and H. Wiig (1997): Structural Adjustment and Soil Degradation in Tanzania. A CGE-model Approach with Endogenous Soil Productivity
- 190 E. Biørn and T.J. Klette (1997): Panel Data with Errors-in-Variables: A Note on Essential and Redundant Orthogonality Conditions in GMM-estimation
- 191 L. Belsby and B.K. Wold (1997): Primary Schooling in Zambia Squeezed at Community and Household Level
- 192 E. Bowitz and Å. Cappelen (1997): Incomes Policies and the Norwegian Economy 1973-93
- 193 S. Glomsrød, M.D Monge A. and H. Vennemo (1997): Structural Adjustment and Deforestation in Nicaragua
- 194 F. Johansen and T.J. Klette (1997): Wage and Employment Effects of Payroll Taxes and Investment Subsidies
- 195 T. Fæhn (1997): Non-Tariff Barriers - the Achilles' Heel of Trade Policy Analysis
- 196 R. Aaberge and A. Langørgen (1997): Fiscal and Spending Behavior of Local Governments: An Empirical Analysis Based on Norwegian Data
- 197 A.C. Hansen and H.K. Selte (1997): Air Pollution and Sick-leaves - is there a Connection? A Case Study using Air Pollution Data from Oslo
- 198 E. Holmøy and T. Hægeland (1997): Aggregate Productivity Effects of Technology Shocks in a Model of Heterogeneous Firms: The Importance of Equilibrium Adjustments
- 199 E. Berg, P. Boug and S. Kverndokk (1997): Norwegian Gas Sales and the Impacts on European CO<sub>2</sub> Emissions
- 200 H.C. Bjørnland (1997): Estimating Core Inflation – The Role of Oil Price Shocks and Imported Inflation
- 201 R. Aaberge, A. Bjørklund, M. Jäntti, P.J. Pedersen, N. Smith and T. Wennemo (1997): Unemployment Shocks and Income Distribution. How Did the Nordic Countries Fare During their Crises?
- 202 L. Brubakk (1997): Estimation of Price Elasticities from Norwegian Household Survey Data
- 203 J. Aasness and L. Belsby (1997): Estimation of Time Series of Latent Variables in an Accounting System: Petrol Consumption of Norwegian Households 1973-1995
- 204 A. Rygh Swensen (1997): Change in Regime and Markov Models
- 205 K. Nyborg and I. Spangen (1997): Cost-Benefit Analysis and the Democratic Ideal
- 206 L. Belsby and J.F. Bjørnstad (1997): Modelling and Estimation Methods for Household Size in the Presence of Nonresponse: Applied to The Norwegian Consumer Expenditure Survey
- 207 K.O. Aarbu and T.O. Thoresen (1997): The Norwegian Tax Reform; Distributional Effects and the High-Income Response
- 208 T. Hægeland and T.J. Klette (1997): Do Higher Wages Reflect Higher Productivity? Education, Gender and Experience Premiums in a Matched Plant-Worker Data Set
- 209 J. Gjerde, S. Grepperud and S. Kverndokk (1998): Optimate Climate Policy under the Possibility of a Catastrophe
- 210 T. Eika and K.A. Magnussen (1998): Did Norway Gain from the 1979-85 Oil Price Shock?
- 211 K.O. Aarbu and J.K. MacKie-Mason (1998): Why Some Corporations Pay More Tax than Necessary
- 212 R. Aaberge (1998): UMP Unbiased Tests for Multiparameter Testing Problems with Restricted Alternatives
- 213 M. Søberg (1998): "EPA's New Emissions Trading Mechanism: A Laboratory Evaluation" – A Comment
- 214 K. Nyborg (1998): Non-Verifiable Emissions, Voluntary Agreements, and Emission Taxes

215	H. C. Bjørnland (1998): Economic Fluctuations in a Small Open Economy - Real versus Nominal Stocks	239	K.A. Brekke, R.B. Howarth and K. Nyborg (1998): Are there Social Limits to Growth?
216	L.C. Zhang (1998): Post-Stratification and Calibration – A Synthesis	240	R. B. Howarth and K. A. Brekke (1998): Status Preferences and Economic Growth
217	R. Aaberge and Y. Zhu: The Pattern of Household Savings during a Hyperinflation. The Case of Urban China in the Late 1980s	241	H. Medin, K. Nyborg and I. Bateman (1998): The Assumption of Equal Marginal Utility of Income: How Much Does it Matter?
218	L.C. Zhang (1998): A Note on Post-stratification when Analyzing Binary Survey Data Subject to Non-response	242	B. Bye (1998): Labour Market Rigidities and Environmental Tax Reforms: Welfare Effects of Different Regimes
219	T.J. Klette and J. Møen (1998): From Growth Theory to Technology Policy – Coordination Problems in Theory and Practice	243	B.E. Naug (1999): Modelling the Demand for Imports and Domestic Output
220	L.C. Zhang (1998): Synthetic Graphical Modelling of Binary Panel Data Subject to Non-response. A Case Study	244	J. Sexton and A. R. Swensen (1999): ECM-algorithms that converge at the rate of EM
221	J.K. Dagsvik (1998): Choice among Lotteries when Preferences are Stochastic	245	E. Berg, S. Kverndokk and K.E. Rosendahl (1999): Optimal Oil Exploration under Climate Treaties
222	J.K. Dagsvik (1998): Nonparametric Identification of Discrete Choice Models	246	J.K. Dagsvik and B.H. Vatne (1999): Is the Distribution of Income Compatible with a Stable Distribution?
223	L. Brubakk and J.K. Dagsvik (1998): Consumer Demand and Unobservable Product Attributes	247	R. Johansen and J.K. Dagsvik (1999): The Dynamics of a Behavioral Two-Sex Demographic Model
224	E. Holmøy (1998): Potential Aggregate Gains from Improved Sectoral Efficiency: General Equilibrium Estimates for Norway	248	M. Sjøberg (1999): Asymmetric information and international tradable quota treaties. An experimental evaluation
225	B.H. Vatne and J.K. Dagsvik (1998): Estimation of Generalized Extreme Value Models by a Max-spectral Representation	249	S. Grepperud, H. Wiig and F.A. Aune (1999): Maize Trade Liberalization vs. Fertilizer Subsidies in Tanzania: A CGE Model Analysis with Endogenous Soil Fertility
226	I. Svendsen (1998): Rational Expectations in Price Setting – Tests Based on Norwegian Export Prices	250	K. A. Brekke and Nils Chr. Stenseth (1999): A Bio-Economic Approach to the study of Pastoralism, Famine and Cycles. Changes in ecological dynamics resulting from changes in socio-political factors
227	K.A. Brekke and R.B. Howarth (1998): The Social Contingency of Wants: Implications for Growth and the Environment	251	T. Fæhn and E. Holmøy (1999): Welfare Effects of Trade Liberalisation in Distorted Economies. A Dynamic General Equilibrium Assessment for Norway
228	K.A. Brekke and E. Moxnes (1998): Do Models Improve Fishery Management? Empirical Evidence from a Experimental Study	252	R. Aaberge (1999): Sampling Errors and Cross-Country Comparisons of Income Inequality
229	J.K. Dagsvik, Yu Zhu and R. Aaberge (1998): A Framework for Empirical Modelling of Consumer Demand with Latent Quality Attributes	253	I. Svendsen (1999): Female labour participation rates in Norway – trends and cycles
230	R. Aaberge, U. Colombino and S. Strøm (1998): Social Evaluation of Individual Welfare Effects from Income Taxation: Empirical Evidence Based on Italian Data for Married Couples	254	A. Langørgen and R. Aaberge: A Structural Approach for Measuring Fiscal Disparities
231	R. Nesbakken (1998): Residential Energy Consumption for Space Heating in Norwegian Households. A Discrete-Continuous Choice Approach	255	B. Halvorsen and B.M. Larsen (1999): Changes in the Pattern of Household Electricity Demand over Time
232	R. Nesbakken (1998): Price Sensitivity of Residential Energy Consumption in Norway	256	P. Boug (1999): The Demand for Labour and the Lucas Critique. Evidence from Norwegian Manufacturing
233	M. Sjøberg (1998): Uncertainty and International Negotiations on Tradable Quota Treaties	257	M. Rege (1999): Social Norms and Private Provision of Public Goods: Endogenous Peer Groups
234	J.K. Dagsvik and L. Brubakk: Price Indexes for Elementary Aggregates Derived from Behavioral Assumptions	258	L. Lindholt (1999): Beyond Kyoto: CO <sub>2</sub> permit prices and the markets for fossil fuels
235	E. Biørn, K.-G. Lindquist and T. Skjerpen (1998): Random Coefficients and Unbalanced Panels: An Application on Data from Norwegian Chemical Plants	259	R. Bjørnstad and R. Nymoen (1999): Wage and Profitability: Norwegian Manufacturing 1967-1998
236	K. Ibenholt (1998): Material Accounting in a Macroeconomic Framework. Forecast of waste generated in manufacturing industries in Norway	260	T.O. Thoresen and K.O. Aarbu (1999): Income Responses to Tax Changes – Evidence from the Norwegian Tax Reform
237	K-G. Lindquist (1998): The Response by the Norwegian Aluminium Industry to Changing Market Structure	261	B. Bye and K. Nyborg (1999): The Welfare Effects of Carbon Policies: Grandfathered Quotas versus Differentiated Taxes
238	J.K. Dagsvik, A.S. Flaatten and H. Brunborg: A Behavioral Two-Sex Model	262	T. Kornstad and T.O. Thoresen (1999): Means-testing the Child Benefit
		263	M. Rønsen and M. Sundström (1999): Public Policies and the Employment Dynamics among new Mothers – A Comparison of Finland, Norway and Sweden