

**PARTNER CHOICE AND WOMEN'S PAID WORK IN SWEDEN**  
**- THE ROLE OF EARNINGS**

by

Ursula Henz\* and Marianne Sundström\*\*

Forthcoming in: *European Sociological Review* Vol. 17 No.3 Sept. 2001

**Abstract:** Recent observations of higher labour-market activity among women with a high-earning spouse and widened household inequality have spurred research interest in earnings homogeneity and in effects of own and spouse's earnings on female labour supply. This article studies trends in earnings homogeneity among married and cohabiting parents and in effects of own and spouse's earnings on mothers' time in employment and non-employment in Sweden. We analyse, first, correlations between spouses' earnings and, second, effects of time-varying own and spouse's earnings on mothers' transitions between part-time and full-time work, on their exits from and re-entries into employment and on their exits from parental leave over the years 1968-92. We use individual life histories from the 1992 Swedish Family Survey combined with longitudinal information on earnings from the national taxation register. A unique aspect of this data set is that it has very accurate longitudinal earnings information for both married and cohabiting spouses, including former spouses. We find that mothers' own earnings have a larger and more significant impact on their labour-market transitions than spouse's earnings and that the impact of the latter has even declined over time.

\* Institute for Gerontology, King's College London, Franklin-Wilkins Building, 150 Stamford Street, London SE1 8 WA, United Kingdom. Phone +44-171-872-3035 Fax +44-171-872-3235. e-mail [Ursula.Henz@kcl.ac.uk](mailto:Ursula.Henz@kcl.ac.uk)

\*\* Swedish Institute for Social Research, Stockholm University, SE-10691 STOCKHOLM, SWEDEN Phone +46-8-163136 Fax +46-8-163693 e-mail [Marianne.Sundstrom@sofi.su.se](mailto:Marianne.Sundstrom@sofi.su.se)

## **PARTNER CHOICE AND WOMEN'S PAID WORK - THE ROLE OF EARNINGS**

The growth in female labour force participation in the industrialized countries during the 1960s and 1970s gave rise to a large body of research on female labour supply. A common finding of these studies was that the woman's own wage increased her labour-market activity while the husband's income reduced it and that the former effect tended to exceed the latter (for a review, see for example Killingsworth and Heckman, 1986). In the last couple of decades steeper growth in participation rates has, however, been observed in several countries among women married to men with higher earnings at the same time as household inequality has widened (see for example Juhn and Murphy, 1997; Cancian and Schoeni, 1996; Karoly and Burtless, 1995). Similarly, cross-section tables for 1996 indicated that Swedish women with a high-earning partner work longer hours, on average, than those with a low-earning partner (Karlberg, 1999). These trends have spurred research interest in assortative mating, since one possible explanation for the rise in participation of wives of higher earning husbands is that these wives have higher market earning capacity, that is, that there is increased positive assortative mating (homogamy) based on labour market characteristics. Alternative explanations are, of course, that the impact of spouses' earnings on women's labour supply has declined or that the impact of women's own earnings has grown over time.

The purpose of this article is to study the allocation of time between employment and non-employment among married and cohabiting mothers and its changes over the years 1968-92. To that end, we study the impact of own and spouse's earnings on the labour-market transitions of married and cohabiting mothers in Sweden. Using hazard models we analyse the transitions between employment and non-employment, between full-time and part-time work, as well as from parental leave to full-time and part-time work and include earnings as time-varying covariates which has not been done in prior research. Previous labour-market studies have used hazard regression mainly to analyse exits from unemployment

and women's return to work after childbirth. Recently, this method has however been employed for analyses of other labour-market transitions, for example by Blossfeld and Rohwer (1997) for Germany, and by Drobnic and Wittig (1997) for the U.S, but neither of these studies analyses the impact of earnings.

We start, however, by investigating and comparing the degree of earnings homogeneity among married and cohabiting couples with children, its changes with partnership duration and over calendar time, first of all, because any change in mothers' paid work found in the transition analysis could be the result of changes in pre-union specialization or in assortative mating based on earnings. Second, examining the trend in earnings homogeneity is warranted in its own right since it affects household income inequality and living conditions of children. In particular, the Swedish case is of interest since Sweden has long had high female labour force participation, high levels of cohabitation as well as low levels of household income inequality by international comparison.

We use data from the 1992 Swedish Family Survey (SFS) supplemented by very accurate earnings information from the national taxation register. A valuable aspect of this data set is that it comprises life-history information from age 17 on both married and cohabiting individuals. A unique aspect of the data set is that it includes longitudinal earnings data for the respondent and her or his spouse, including former spouses, if they were married, or for cohabitants if they had a child together. Pre-union or pre-childbirth earnings data are available only for respondents.

The article has the following outline: In the next section we discuss the literature on assortative mating based on earnings and on effects of own and spouse's earnings on women's labour market activity. To give a background to the Swedish case, the following section briefly reviews trends in female labour market activity and in rates of marriage and cohabitation as well as presents the Swedish parental-leave programme. Next, we present our data and then our results on correlations between

spouses' earnings. After that, we turn to mothers' labour-market transitions and give an account of method, sample and covariates used in the analysis. We present our findings in the following section and end by a concluding discussion.

## **RELATED LITERATURE**

### ***Specialization and assortative mating***

According to a well known theory the major economic gains to partnership formation arise from specialization on market and non-market work and exchange based on the relative comparative advantages of spouses (Becker, 1991). When the time uses of the partners are more complementary and less substitutable, the degree of specialization will be lower. Becker argues that positive assortative mating on most traits will dominate, that is, 'high-quality' men and women will tend to marry each other rather than selecting 'lower-quality' mates when these qualities are complements (p.114).<sup>1</sup> Correlations between intelligence, education, age, race, wealth, religion, ethnic origin, height, place of origin and many other traits of spouses have, in accordance with this theory, been found positive and strong (for a review, see Kalmijn 1998). Somewhat contradictorily, Becker then claims that a negative sorting by wage rates should be optimal but has difficulties finding comforting evidence on that (p.118). This is not surprising since a positive correlation is not inconsistent with a gender-based division of labour. Neither does it preclude that wives of higher earning men work fewer market hours than wives of lower earning men. Davies, Peronaci and Joshi (1998) argue that considerations of search costs, too, might lead us to expect positive sorting based on wage rates since men and women with similar wage rates are more likely to encounter each other, than those with very different wage rates, if the educational and work environments also function as partnership brokerages. They suggest that the importance of this consideration has grown over time due to the increased participation of women in higher education,

decreased occupational segregation and the declining importance of other social institutions such as churches.

Another reason why spouses' traits may be positively correlated is that there may be other economic gains to marriage than those from specialization: there may even be disadvantages associated with specialization (see Oppenheimer and Lew, 1995). Blau and Ferber (1986), Lam (1988) and Weiss (1997) emphasise gains such as the sharing of household public goods, risk sharing and positive externalities from the consumption of the other spouse. These gains will be greater among homogamous couples and may have become more important over time.

A critical issue is, however, at which point in time correlations are measured. To make inferences about whether there is positive (or negative) sorting in traits that might change over time, such as wages, one needs data prior to union formation. This is because the wages we observe during partnership are the result of, in part, pre-partnership characteristics and, in part, of the division of labour during partnership, given these characteristics. On the other hand, since wages at younger ages are rather weakly correlated with life-time earnings (Björklund, 1993), pre-partnership earnings correlations may be misleading. Studies of assortative mating using post-marriage data have generally focused on traits that do not change, such as race, or traits that do not change much beyond a particular point, such as educational level. Thus, Björklund (1992), whose study is the only Swedish one, finds a strong and positive correlation between husbands' and wives' education. Also the well-known study by Mare (1991), which uses data on newlyweds in the U.S., finds an increasing association between spouses' schooling from the 1930s to the 1970s, but a stable or decreasing one for the 1980s. When adjustments are made for time between school and marriage, evidence of increased educational homogamy remains. Mare suggests that this is due to increased competition in the marriage market for wives with good labour market prospects.<sup>2</sup>

Studies of partner choice among cohabiting couples are rare. Schoen and Weinick (1993) is unique in comparing the degree of age, educational, religious and racial homogamy among young married and cohabiting couples in the U.S. Interestingly, cohabitants showed a greater propensity to choose a partner with the same education and a lower propensity to choose a partner with the same age or religion, as compared to recently married persons. Since year of birth and religion are more permanent characteristics of a partner, they interpret their finding as supporting their view that marriages are more long-term, and cohabitations “looser bond”, relationships.

Few studies have analysed assortative mating based on wage rates. Recently, however, Juhn and Murphy (1997) found a positive relationship between the wife’s wage rate and the husband’s hourly wage decile for the U.S., a relationship which became more positive over the years 1969-89. Dirven, Lammers and Ultee (1991) found evidence of positive sorting in wage rates for seven countries, including Australia, Canada, the Netherlands and West Germany around 1980. Most other studies have used data on annual earnings. Thus, using the Luxembourg Income Study Cancian and Schoeni (1996) analyse correlations in annual earnings for married couples in ten developed countries. They find positive correlations for Australia, Canada, France, Israel, Norway, Sweden - which had the highest values, the U.S. and positive, but low, for the U.K. For countries for which there are data for two years - Australia, France, Sweden and the U.S.- they find increasing earnings homogamy. Interestingly, they find negative earnings correlations for Germany and Switzerland. A limitation of the study is that it does not take marriage duration into account.

Davies et al. (1998) use pre- and post-union formation data on spouses’ earnings to analyse assortative mating and specialization among British married and cohabiting couples. They find a strong tendency towards positive assortative mating by earning power. The correlation between the estimated potential earnings of partners at the time of union formation is about 50 percent, while the correlation of

current earnings is lower. The initial spousal wage gap had a significantly negative effect on the woman's full-time work experience after partnership formation and so had union duration. Interestingly, these two relationships held for married couples but not for cohabitants. The results suggest, the authors say, that marriage is more likely than cohabitation to lead to specialization. However, it is possible also that couples self-select into the two types of partnership based on their preferred time allocation.

***Effects of own and spouses' earnings on women's labour-market activity***

Has the impact of women's wages and spouse's earnings on female labour supply changed over time?

Unfortunately, it is difficult to draw firm conclusions from the recent studies that have used advanced methods to take account of taxes and transfers, since the range of estimates is wide (see Aronsson and Walker 1997 for a review of the Swedish evidence). The findings of Leibowitz and Klerman (1995) on the employment of U.S. married mothers suggest, however, that the positive effect of female earnings intensified over the period 1971-90 and that the effect of men's earnings became less negative.

Consistent with these results, Sundström (1987) found positive effects of Swedish women's wages on annual hours worked for the years 1967, 1973 and 1980, and smaller, as well as weakening, negative effects of non-labour income (mainly spouse's earnings); the effect for 1980 was not even statistically significant (p.132).

As mentioned, previous labour-market studies have mainly used hazard regression to analyse women's return to work after childbirth (see for example Joesch, 1997; Rønsen and Sundström, 1996) and the exits from unemployment, although the latter studies have rarely distinguished between women and men (for a review, see for example Pedersen and Westergaard-Nielsen, 1993). Recently, however, hazard regression has been employed to analyse women's transitions between part-time work, on the one hand, and non-employment or full-time work, on the other hand, for example by Blossfeld and Rohwer (1997) for Germany, de Graaf and Vermeulen (1997) for the Netherlands, Leth-Sørensen and

Rohwer (1997) for Denmark and Drobic and Wittig (1997) for the U.S, none of which include earnings covariates. Bernasco (1994) does include husband's earnings in his analysis of Dutch women's exits from and entries into employment. He finds the expected positive (and significant) effect of husband's earnings on women's exits rates while the effect on entry rates is insignificant. However, one cannot make inferences about the relative importance of women's own and their spouse's earnings from this study since women's earnings are not included.

## **THE SWEDISH BACKGROUND**

### ***Trends in female labour-market activity***

During the 1970s and 1980s employment rose strongly among Swedish women, especially among those with children. The rise was particularly steep in the 1970s when labour-force participation rose from 59 percent in 1970 to 75 percent in 1980 among women aged 16-64 and from 50 percent to 76 percent among mothers of pre-school children. The rise continued in the 1980s, but at a slower rate, to reach 83 percent among all women and 87 percent among those with pre-school children in 1990. The recession in the 1990s brought the rates down to 74 percent and 78 percent, respectively, in 1998 (Swedish Labour Force Surveys). This rise in female employment has, however, largely taken the form of part-time work.<sup>3</sup> The proportion of employed women working part time rose from about 38 percent in 1970, peaked at 47 percent in 1982, decreased to 42 percent in 1990 and further decreased to 37 percent in 1998. Part-time work is particularly common among Swedish mothers of pre-school children: the proportion has remained close to 60 percent among these mothers throughout the period studied. Previous research (Sundström, 1987, 1993, 1997) has suggested that while women's propensity to work part time tends to vary over the life-cycle, overall shifts in women's part-time work in Sweden are closely related to the system of social benefits and tax rates and changes in these. Swedish part-time



workers have long been entitled to the same social benefits as full-time workers, some, such as sick-pay, proportional to earnings and others, such as vacation weeks, on an equal basis. Also, in the 1970s several options of reduced hours were introduced for full-time workers, some of which had compensation for loss of income (for example, part-time parental leave). Further, while the marginal tax rates for married women were reduced substantially in the early 1970s through the introduction of individual taxation of married spouses, they rose considerably in the late 1970s also for average income earners, which increased the profitability of part-time work over full-time work. When marginal tax rates were cut in 1983 and thereafter, full-time work increased again among women.

### ***The parental-leave programme***

Employed Swedish mothers have had the right to maternity leave at childbirth with some pay since 1955, with length of leave prolonged in 1962. The current programme dates from 1974 when six months of parental leave was extended to fathers and the replacement level raised from about 65 percent to 90 percent of previous earnings up to a relatively high ceiling. Leave benefits are paid out of general taxes and can be used full time or part time any time before the child turns eight. Benefits are taxable and pensionable and give employed recipients the right to paid vacation. The benefit period was extended to seven months in 1975 and to nine months in 1978, the ninth of which was compensated at a flat rate equal for all recipients. In 1980 the leave entitlement was further extended to 12 months and in 1989 to 15 months. Since 1980 the three last months of leave have been compensated at the flat rate. Parents with no earnings prior to childbirth receive only the low flat rate payment, so the programme gives women a strong incentive to be employed prior to childbirth and even to postpone childbirth until earnings are sufficiently high.<sup>4</sup>

### *Changes in rates of marriage and cohabitation*

Over the past three decades marriage rates have declined in Sweden at the same time as non-marital cohabitation has become increasingly more common. Among women born in the late 1930s about one-third had lived in a consensual union before marrying or having a first birth and this proportion rose to more than four-fifths among women born in the early 1950s (Hoem and Rennermalm, 1985). Also, the duration of cohabitation has increased considerably; among women born in 1949 almost two-thirds had married their partner within five years of cohabitation but this was true only for about one-third of women born in 1964 (Bracher and Santow, 1997). Despite all this, the propensity to enter a union has not declined; four-fifths of women and two-thirds of men born between 1949 and 1964 had been in a union (marital or consensual) at least once by age 25 (Hoem, 1995a).

### **DATA**

Our analyses of correlations between spouses' earnings and of mothers' labour-market transitions are both based on the 1992 Swedish Family Survey (SFS) conducted by Statistics Sweden. Both women and men were interviewed. The survey contains retrospective histories of respondents' partnerships, childbirths, educational activities, employment, and other activities, as well as information on family background. The SFS is based on samples from five birth cohorts, namely 1949, 1954, 1959, 1964, and 1969, but information on men is restricted to the 1949, 1959, and 1969 cohorts. All in all, 4,984 persons were interviewed of whom 3,317 were women. The survey information has been combined with data on annual earnings for respondents and their partners (including former partners) from the national taxation register for the years 1968-92. Therefore, our earnings data are very accurate and not subject to recall or measurement errors. On the other hand, the employment histories are not detailed enough to

enable us to calculate wage rates. We do, however, control for months and hours worked in a multivariate analysis of earnings correlations (see below). Earnings include income-related and taxable transfers, such as sick pay and parental leave benefits from 1974.<sup>5</sup> For individuals who had income from employment we also include their income from self-employment (for more details on the definitions of earnings variables, see Appendix 1). Information about partners' earnings is available for all years for married couples, but for cohabiting couples only in the years after they had a child together. As a result, the following analyses are restricted to the 2,135 women in the SFS who had at least one child and lived with a partner after first birth.

### **EARNINGS HOMOGENEITY AMONG MARRIED AND COHABITING COUPLES WITH CHILDREN**

At the time of first birth the married and the cohabiting women in our sample differ on several characteristics and the differences have increased over time (Table 1). The married scored higher on indicators of social status than the cohabitants and this tendency was stronger among those that had their first birth after 1979. Among the married, more women had a university degree, fewer had a father who was a blue-collar worker and their earnings were slightly higher and so were those of their spouse. Also, married women were older on average, had longer experience of full-time work and had lived with their partner longer than cohabiting women at the time of first birth. In addition, the married more often had at least one religious parent and were to a larger extent born outside Sweden (for a closer analysis, see Bracher and Santow, 1997). Further, Bernhardt (1995) demonstrates that cohabiting parents are less likely than married parents to pool their finances; about 88 percent of married parents reported that they pooled their finances completely, as compared to 76 percent of cohabiting parents. In addition, cohabitations in Sweden, as elsewhere in the world, have much higher break-up rates than formal

marriages (Hoem and Hoem, 1992). The two latter facts are consistent with the hypothesis raised above that cohabitation is a looser type of partnership and less conducive to specialization.

Clearly, cohabiting and married parents differ substantially. What about the partners - are they more similar in terms of earnings power if they are married than if they are cohabiting? If cohabitation implies a lower commitment than marriage, and if homogamy increases partnership utility, we would expect married partners to be more equal and their earnings to be more similar than those of cohabiting partners. On the other hand, marriage might be more conducive to a gender-based division of labour between partners, so for that reason we may hypothesize earnings of the married to be more unequal than those of cohabitants. Whichever is the case, we should expect the gains from such a specialization to have diminished over time because, among other factors, male - female wage differentials have narrowed (Edin and Richardson 1998) and public policies, such as parental leave and subsidized day-care, have stimulated mothers' labour supply (Rønsen and Sundström, 1996). Spouses' earnings should thus have become more similar, especially among married parents.

We compute the correlations (Pearson correlations coefficients) between spouses' annual earnings one year and five years after first birth by period of first birth.<sup>6</sup> Both married and cohabiting parents seem indeed to be positively sorted based on earnings (Table 2), although correlations among cohabiting parents are lower and less significant, especially when broken down by period.<sup>7</sup> This is in line with the "looser bond" hypothesis, but might also reflect the fact that earnings of cohabitants at first birth diverge more from their potential earnings, since they are younger on average than the married. Also, correlations increase over calendar periods of first birth for married couples, but not for cohabitants. This suggests that the degree of specialization has decreased among the married, as expected. Our results for the married are highly similar to the correlations of .186 for all Swedish married couples in 1981 and of

.227 in 1987 found by Cancian and Schoeni (1996). They are also quite similar to - or even higher than - those found for the corresponding Finnish marriage cohorts by Cancian and Jäntti (1997).<sup>8</sup>

When it comes to the possible change in assortative mating based on earnings the results are less informative, however, since they could be due to the rise in mothers' labour market activity. As mentioned, we can not compute wage rates, and therefore to analyse this issue we regress the woman's annual earnings on spouse's earnings and standardize for her labour market activity by including controls for her months of full-time work, months of long part time and months of short part time during the income year.<sup>9</sup> We also control for the woman's age, and to take account of possible loss in earnings due to maternity leave, the age of the youngest child in months. Since earnings data are censored at zero we use a tobit-model (see Maddala, 1983).

The tobit-estimates also show a positive correlation between spouses' annual earnings for married couples (Table 3).<sup>10</sup> Among cohabiting couples there is no clear pattern. However, we find no evidence of increased sorting based on earnings over calendar periods of birth even among the married, nor does the relationship between husbands' and wives' earnings change much over the five years. Thus, from Table 2 and 3 together we conclude that there is assortative mating based on earnings among married couples which has remained stable over time, that the degree of positive sorting is greater among married than among cohabiting couples and that the division of labour has become less traditional among married parents.

## **MOTHERS' LABOUR-MARKET TRANSITIONS**

### ***Method***

We analyse selected labour market transitions for women using piece-wise constant exponential hazard models (see for example Blossfeld and Rohwer, 1995). The dependent variable is the hazard rate

$$r(t|X(t)) = \lim_{\Delta t \downarrow 0} \frac{P(t, t + \Delta t | T \geq t, X(t))}{\Delta t}$$

where  $T$  is the time of the event of interest,  $t$  is any fixed point in time under risk and  $P(t, t + \Delta t)$  is the probability that the event occurs in the interval  $[t, t + \Delta t)$ .  $X(t)$  represents the vector of explanatory variables, which may, or may not, vary with duration  $t$ . In piece-wise constant hazard models, the time axis is divided into intervals and the hazard rate is assumed to be constant in each interval. As duration intervals we choose multiples of six months, the choice of which varies between transitions depending on the exit rates observed. The effects of the covariates on the hazard rate are assumed to be constant over the observation period.

Our units of observation are women's spells in the different labour market states, not the individual women, and thus some women may have more than one episode of the same type. If the recurrent spells are influenced by unobserved characteristics, the model assumption of independence between episodes will be violated. As a consequence there is a possibility that the standard errors of the parameters will be underestimated and that the estimates will be biased.

To check for dependence among observations, we follow a procedure suggested by Allison (1995) and estimate models for second episodes with the duration of the first episode of that type included as a covariate. If the durations of the first and second episodes are uncorrelated, possible dependence between episodes can be ignored. We find no significant relationship between durations of first and second episodes for any of our transitions.<sup>11</sup>

### ***Sample and labour-market transitions***

We analyse the labour-market transitions of married and cohabiting women who had their first birth in 1968-92. Since we are interested in the effects of own and spouse's earnings on mothers' time in paid work, we focus on transitions which involve a change in hours of work, that is, the transitions between

full-time and part-time work, between employment and non-employment and the exits from parental leave to part-time and full-time work. Thus, we do not analyse entries into and exits from education, nor entries into parental leave, the latter basically reflecting the decision to have a child. We follow women's labour-market activities from January of the year in which they turned 17 or from first birth, whichever occurred later.<sup>12</sup> The observation period ends either at separation from the partner or at interview, whichever occurred earlier. For many couples our earnings information does not cover their whole observation period. When the earnings history is incomplete we have used the part which is available (for further details, see Appendix 1).

For the observation period all episodes of full-time employment, part-time employment<sup>13</sup>, full-time education, and parental leave are identified.<sup>14</sup> Remaining gaps are classified as non-employment and are only taken into account if they were longer than three months. We present the resulting months spent in full-time work, part-time work, parental leave and non-employment and their distribution on background characteristics in Table A, Appendix 2. Clearly, part-time work dominates among mothers in our sample.

Spells analysed start immediately after the transition to the state of interest and, consequently, episodes end at the transition to another state, except for parental leave episodes. The latter are censored if, and when, a new birth occurs more than ten months after the beginning of the leave. A new leave episode starts at the time of the new birth.

Table 4 reports the resulting number of labour market transitions for women and, for comparative purposes, for men. Shifts between, on the one hand, part-time or full-time work and, on the other hand, parental leave are the most frequent transitions women make. As described above, the entitlement period of maternal/parental leave was extended in steps from six months (since 1962) to 15 months (since 1989) during the period studied. Since the number of women employed, and hence the

number entitled to maternity leave, has increased, time spent non-employed after childbirth has decreased over the period, and across cohorts. This was accompanied by only a minor increase in the duration of parental leave. Thus, while average time in non-employment dropped from 41 months in the 1949 birth cohort to 16.2 months in the 1964 cohort, average duration of parental leave rose only from 11.8 months for the former cohort to 13.7 months for the latter cohort. A factor contributing importantly to this trend was no doubt the expansion of subsidized child care (see Gustafsson and Stafford, 1992). The number of transitions of men reflect their strong attachment to full-time work. Men experienced far fewer transitions than women. However, the shifts between full-time work and full-time education and those from full-time work to non-employment reach levels comparable to those for women.

### *Covariates*

The covariate *woman's earnings* equals her during the calendar year before the year at risk. In the same way, *spouse's earnings* is her partner's earnings during the previous calendar year. Both covariates are time-varying and expressed in 1992 Swedish crowns (in 10,000) (SEK 100 = EUR 11.50 as of November 1999). We expect mothers' amount of paid work to be positively affected by their own earnings and negatively affected by spouse's earnings, since higher own earnings increase the profitability of paid work while higher earnings of the spouse make mothers better able to afford to work less.

Figure 1 displays the trends in women's and spouses' earnings in the year of first birth and in women's highest earnings prior to or in the year of first birth by year of first birth. During the late 1960s and the 1970s the earnings gap decreased and virtually disappeared in the early 1980s, presumably because women's earnings increased more rapidly than men's. But in the course of the 1980s and early 1990s, the earnings gap widened again as women's earnings flattened and men's increased. This is consistent with the findings, for example by Edin and Richardson (1998), of a rapid reduction in the



Swedish gender wage gap during the 1970s and a small increase during the 1980s. Figure 2 shows the frequency distribution of the difference between women's highest earnings before or at childbirth and the annual earnings of the spouse around childbirth. Interestingly, for about 34 percent of the couples the woman's highest earnings exceed the actual earnings of her spouse.

To assess the effects of own and spouse's earnings on mothers' labour-market transitions we control for other characteristics of the woman and her family. We tested several possible control variables with the ambition to keep models simple and to include a common set of covariates in all models (for tests of other covariates, see Henz and Sundström, 1998). However, since mothers' labour-market transitions are closely linked to changes over the family cycle (cf. Sundström, 1997), we include different dummies for age of youngest child for different transitions and include number of children in some, but not all, analyses of transitions (see below).

A first group of covariates used relates to the mother's accumulated human capital. Her *age* is measured in years since age 16 and varies with time. Education is measured in approximate *years of schooling*<sup>15</sup> and may change over time. The variable *work experience* measures years of work experience in full-time equivalents and is time-varying.<sup>16</sup> Since mothers who have accumulated more human capital should be expected to have a stronger work commitment we hypothesize the human capital variables to have a positive impact on mothers' market work.

We also include covariates which are possible correlates of the woman's home productivity. The time-varying covariate *married* takes the value 1 if the woman is married and 0 if she is cohabiting. We hypothesize formal marriage to have a negative impact on mothers work in market, since marriage should be associated with more work in the home than cohabitation. As mentioned, the child-variables included differ between transitions. The *age of the youngest child* is taken into account by time-varying dummy variables for ages *less than seven years* for the transitions between part-time and full-time work and

*less than two years* for transitions between employment and non-employment. In the latter transitions we also include the *number of children* at home, which may vary with time. This covariate is also used in the analysis of exits from parental leave since exit risks may differ according to parity and since age of youngest child would be collinear to the duration variable itself. As home productivity, and thereby hours of non-market work, should be higher the more and the younger children the woman has, we expect the presence of young children as well as the number of children to reduce mothers' paid work.

Since the duration of parental leave is likely to be influenced by the length of the entitlement period, we include a covariate, statutory *parental leave length*, in the analysis of exits from parental leave to account for its step-wise extension (described above). The value of the covariate depends on the year of birth of the currently youngest child and thus equals six for children born in 1966-73, seven for those born in 1974, eight for those born in 1975-77, ten for those born in 1978-79, 13 for those born from 1980 to July 1989 and if the youngest child was born in August 1989 or later it takes the value 16.<sup>17</sup>

We also investigate whether the effects of own and spouse's earnings have changed over time. It is possible, for example, that the Swedish tax reform in 1983 and thereafter, by which marginal tax rates for most full-time workers were cut in steps, increased the impact of women's own earnings. To that end we include a time-varying covariate which indicates whether the time at risk for making a certain transition is before 1985 or in *1985 and later*, and run it in interactions with own and spouse's earnings.

## **FINDINGS**

### ***Rates of transitions between labour-market states***

Examining the survival functions of the transitions analysed, we see that shifts between full-time and part-time work as well as exits from employment occur at lower rates than re-entries into employment from

parental leave or from non-employment (Figure 3). The latter transitions, which comprise larger proportions of women at risk, take place faster. Swedish women have close ties to the job market; the transition that they are least likely to make is the one of leaving work for more than three months. After ten years of continuous full-time or part-time work, only about 20 percent of the spells resulted in an exit to non-employment.

Shifts between full-time and part-time work take place at a rather constant rate over the ten-year period described. After ten years of continuous part-time employment about half of the episodes have ended by a transition to full time. This relatively high mobility between part-time and full-time work in Sweden does not square with the picture of part-time jobs as ‘traps’, as has been suggested for other countries (see for example Beechey and Perkins, 1987).

Consequently, spells in non-employment are relatively short. Both in the first and in the second year at risk about 20 percent of episodes result in re-entry. But the fact that we do not observe any more re-entries after five years of absence suggests that for a non-negligible fraction of women the decision to leave the labour market is final. For transitions from parental leave, two survival functions are estimated; one based on the assumption that full-time work is the only option when returning to work and the other on the assumption that part-time work is the only option. The shape of the curves reflects the relatively high rate at which exits from leave take place, exits to part-time work occurring faster, as indicated by the steeper curve.

### *Effects of women’s own earnings and spouse’s earnings*

Let us now turn to the estimated effects of woman’s own and spouse’s earnings and those of other covariates presented in Table 5. The non-linear effects of own and spouse’s earnings (i.e. the squared terms) were only included in models where they were statistically significant (at at least 10 percent) (for models with all non-linear effects included, see Appendix 2, Table B). Our main finding is that women’s

own earnings in the year before the year at risk have a strong impact on their labour market transitions. For the transitions from part time to full time (column 1), from employment to non-employment (column 3), from parental leave to part time (column 5) and from parental leave to full time (column 6) the signs of the effects are the expected, that is, higher earnings induce mothers to increase the amount of paid work and make them less likely to reduce it. To make it easier to see the impact of both linear and non-linear own-earnings covariates for transitions (2), (4) and (5), we also show them graphically (Figure 4). For the transition from full time to part time (column 2 and Figure 4a) we see that the negative effect dominates for mothers whose earnings are at and above the median. When it comes to re-entry into employment (column 4 and Figure 4b), it is clear that higher own earnings in the previous year increase the re-entry risk up to relatively high earnings. We also see that higher earnings make women return faster from parental leave to part-time work (column 5 and Figure 4c), but that the effect remains constant for earnings above the median.

Importantly, we also find the impact of own earnings to be larger and to have higher statistical significance than that of spouse's earnings, and the latter effect to have the expected sign for the only transition - from full time to part time (column 2) - where it is significant. These results are consistent with those of Sundström (1987) who (using the Swedish Level of Living Survey) found positive and significant effects on female labour supply of own wage rates for 1967, 1973 and 1980, and negative and significant effects of non-labour income (mainly spouse's earnings) for 1967 and 1973 but not for 1980. Most likely, the strong impact of women's own earnings and the insignificance of spouse's earnings are explained by the early and almost complete individualization of the Swedish tax and social security system, which give women strong incentives to be gainfully employed, regardless of spouse's earnings.

*Effects of marital status, human capital, home productivity and calendar period*

The results indicate that marriage is more conducive than consensual unions to a gender-based division of labour in the family, as expected, since employed mothers have higher risks of interrupting work if they are married (Table 5, column 3) and those non-employed have lower risks of re-entry if married (column 4). We also see that mothers return faster from parental leave to full-time work (column 6) if they are married, which seems to contradict the specialization hypothesis. One possible reason why married mothers go back to full-time work faster is, however, that fathers take parental leave to a greater extent if they are married as shown by Sundström and Duvander (1999).

Accumulated human capital, as measured by years of schooling and work experience, is seen to have the expected effects on the transitions for which these indicators are significant. Thus, more schooling makes part-time working mothers more likely to shift to full time (column 1) and those non-employed more likely to re-enter (column 4). Longer work experience makes full-time working mothers less prone to shift to part-time work (column 2). Both variables very strongly reduce the risk of leaving employment (column 3) and speed up the return to full-time work from parental leave (column 6), while neither has any significant impact on exits from parental leave to part time (column 5). Young mothers are more likely to shift from part time to full time (column 1) and to take up full-time work after parental leave (column 6).

Further, home productivity, as measured by the ages and number of children, influences several transitions in a significant way. Thus, women are more likely to shift from part-time to full-time work when their children become of school-age (column 1). Having a child less than two years old is seen both to reduce the risk of leaving work (column 3) and to reduce the risk of re-entry for non-employed mothers (column 4). This puzzling result probably reflects selection into the states of origin, that is, mothers who want to work and those who want to take care of their toddler at home have already made

their choices and arrangements and are little inclined to change them. Two unexpected findings are that the number of children reduces the risk of dropping out of the labour force (column 3) and speeds up the return to full-time work from parental leave (column 6). The effect is, however, produced by a positive correlation between number of children and part-time work experience, which, in turn, reduce the risk of leaving employment as well as that of taking up full-time work after parental leave (see Henz and Sundström, 1998, Table E and H).

Moreover, the extensions of the parental leave entitlement have indeed made parental leave spells longer (column 5-6). In addition, leave spells are influenced by calendar period at risk; even after controlling for the length of the statutory leave, women took longer leave after 1985. We also find that the risk of shifting from part time to full time increased after 1985 (column 1) as did the risk of leaving employment (column 3). The latter effect was, in fact, concentrated to the early 1990s when unemployment rose rapidly (see Henz and Sundström, 1998, Table D-E).

#### *Changes over time in effects of own and spouse's earnings*

We also investigate whether the impact of own and spouse's earnings changes over time by including interactions between the earnings covariates and calendar period after 1985. The results are presented in Table 6 (control variables are not shown but are the same as in Table 5) and in Figure 5, which shows the combined linear and non-linear effects, before and after 1985, including the main effect of calendar period, for statistically significant changes. We, thus, find an increase in the impact of own earnings on the risk of shifting from part-time to full-time work after 1985 (Table 6 column 1 and Figure 5a). This change is probably explained by the cut in marginal tax rates in combination with the high demand for labour at that time (see Sundström, 1993). Also, the effect of own earnings on exits from parental leave to full time (column 6 and Figure 5d) becomes stronger after 1985. By contrast, the effect of own

earnings weakened after 1985 on re-entry into employment (column 4 and Figure 5b) and on exits from parental leave to part-time work (column 5 and Figure 5c).

Generally, the effect of spouse's earnings has diminished after 1985, as we expected. This is true for shifts from part time to full time (column 1 and Figure 5a) and for shifts from full time to part time (column 2), for which we see that the positive effect of spouse's earnings disappears after 1985 (not shown graphically since there are no non-linear effects). We also observe a decrease in the impact of spouse's earnings on exits from parental leave to full time (column 6 and Figure d). When it comes to exits from employment, neither earnings covariate changes in impact over time.

## **CONCLUDING DISCUSSION**

In this article we have investigated the role of women's own and spouse's earnings for the time spent in employment and non-employment by Swedish mothers and its changes over time. We used two different approaches to throw light on this issue. First, we analysed the correlations between spouses' annual earnings among cohabiting and married parents and their changes over time. Second, we studied how own and spouse's earnings, along with other characteristics, influenced mothers' labour-market transitions. We found married couples to be positively sorted in earnings, while among cohabitants correlations were lower and less significant. Among married couples, Pearson correlations between spouses' annual earnings rose over calendar periods, which indicates a less gender-based division of labour. That the rising earnings correlation did not represent increased assortative mating based on earnings was shown by a tobit-regression: the relationship between spouses' annual earnings was positive but stable, controlling for the number of hours and months the mother worked, her age and the age of her youngest child. The findings also suggest that cohabitations are a looser type of unions than marriages.

The analysis of mothers' labour-market transitions showed own earnings to have a strong effect on all transitions studied and a larger and more significant effect than spouse's earnings. In line with prior expectations, higher own earnings generally induced women to increase the amount of paid work. As to changes over time in earnings effects, the results pointed to a decrease in the effect of spouse's earnings, but were less conclusive on own earnings. Another interesting finding, but not unexpected, was that marriage is associated with a more traditional division of labour than consensual unions; re-entry rates were lower and rates of exits from employment were higher for married than for cohabiting mothers. We also found a considerable mobility from part-time work to full-time work which contradicts (at least for Sweden) the picture, suggested for other countries, of part-time work as a 'trap' for women. On the whole, Swedish women were found to have strong ties with the job market, leaving employment was the transition that they were least likely to make. This relatively strong preference for work and the large effect of own earnings, but limited impact of spouse's earnings, are perhaps best understood in light of the strong work incentives created for women by the (almost) completely individualized Swedish social security and tax system.

What do, finally, our findings imply for household inequality in Sweden? On the one hand, the positive and rising annual earnings correlations found for married couples, which were mainly due to the growth in married women's paid work, seem to contribute to increase household inequality. On the other hand, the growth in consensual unions appears to contribute to reduce overall household inequality, since earnings of cohabiting parents were little correlated. Further, we find that mothers' market work has become more independent of spouse's earnings; we can, in fact, reject the hypothesis of a positive impact of spouse's earnings on mothers' market work. However, the effect of this change on household inequality remains an issue for future studies.



---

**NOTES**

- <sup>1</sup> Sociological exchange theory will give similar predictions, see Edwards (1969).
- <sup>2</sup> For more recent studies of age and educational homogamy in the U.S. which also take the availability of potential spouses into account, see Qian and Preston (1993) and Qian (1998).
- <sup>3</sup> Part-time workers are those who ordinarily work 1-34 hours per week according to the Swedish Labour Force Surveys.
- <sup>4</sup> After our study period, the replacement level was reduced to 80 percent (in 1995) and to 75 percent (in 1996), but was raised to 80 percent in 1998 (Albrecht et al., 1999)
- <sup>5</sup> Two changes in taxation laws create discontinuities in the time series. The first took place in 1971 when separate taxation of married spouses was introduced and the second in 1974 when income-related transfers became taxable.
- <sup>6</sup> Our choice of calendar periods is motivated by the fact that transfers such as maternity benefits were taxfree before 1974 and that women's labour market activity rose in the late 1980s.
- <sup>7</sup> Correlations were similar for the couples who remained intact after five years and for whom we have earnings data for both the first year and the fifth year; among the married .26 in the first year and .24 in the fifth, for cohabitants -.06 and .17, respectively (disregarding period of birth).
- <sup>8</sup> Cancian and Jäntti (1997) report a correlation of .221 one year after marriage for couples who married in 1980/85 and one of .252 for those who married in 1985/90.
- <sup>9</sup> Full-time work is defined as work of 35 hours per week or more, long part-time as 25-34 hours and short part-time work as 16-24 hours per week.
- <sup>10</sup> Table 3 has slightly fewer observations than Table 2 because for some observations information is missing on hours worked during the income year.
- <sup>11</sup> The results are not presented, but can be obtained from the authors on request.
- <sup>12</sup> For immigrant women, the observation period begins at immigration to Sweden at the earliest.
- <sup>13</sup> Part-time work is work of 16-34 hours per week. Work of less than 16 hours per week has not been recorded and is hence classified as non-employment in our analysis.
- <sup>14</sup> One may question the accuracy of these histories, since they are retrospective. According to Hoem (1995b), the ability of the respondents to recall past events appears, however, to be quite good. For example, the pattern of unemployment over cohorts is in line with those in the Swedish Labour Force

---

Surveys. Respondents were also asked to prepare for the interview by taking out old work documents etc.

<sup>15</sup> The variable *years of schooling* takes the values 6 (completed university education), 4 (some university education or vocational training beyond secondary level), 3 (3-4 years of upper-secondary education), 2 (2 years of upper-secondary education), 1 (at least one semester of full-time vocational training after compulsory school), and 0 otherwise.

<sup>16</sup> Years of full-time work is multiplied by 1, work of 25-34 hours by 0.75 and work of 16-24 hours by 0.5.

<sup>17</sup> As the observant reader will notice, we have added one month to the entitlement periods since 1974. This is to take account of the fact that parental leave gives employed parents the right to (paid) vacation.

## **ACKNOWLEDGEMENTS**

We thank the Swedish Research Council for the Social Sciences and the Swedish Council for Research in the Humanities and Social Sciences for financial support. We also thank Michael Bracher for advice on the use of the educational life histories. Finally, we thank Anders Björklund, Frances Goldscheider, Johan Fritzell, colleagues at the Demography Unit, participants at the ESPE-meetings in Amsterdam and members of the Research Committee on Social Stratification at the World Congress of Sociology in Montreal for their comments.

## REFERENCES

- Albrecht, J. W., Edin, P. A., Sundström, M., and Vroman, S. B. (1999) Career Interruptions and Subsequent Earnings: A Reexamination Using Swedish Data, *Journal of Human Resources*, **34**, 294-311.
- Allison, P. D. (1995) *Survival Analysis Using the SAS System*. Gary, NC, SAS Institute Inc.
- Aronsson, T. and Walker, J. R. (1997) The Effects of Sweden's Welfare State on Labor Supply Incentives. In Freeman, R. B., Topel, R., and Swedenborg, B. (eds.) *The Welfare State in Transition*. Chicago, University of Chicago Press, pp. 203-265.
- Becker, G. S. (1991) *A Treatise on the Family*. Enlarged edition. Harvard University Press, Cambridge, Mass.
- Beechey, V. and Perkins, T. (1987) *A Matter of Hours*. Cambridge, Polity Press.
- Bernasco, W. (1994) *Coupled Careers. The Effects of Spouse's Resources on Success at Work*. Amsterdam, Thesis Publishers.
- Bernhardt, E. M. (1998) Childless Non-Marital Unions in Sweden: A Normal Stage in the Family Formation Process. In Vaskovics L.A. and Shattovits H.A. (eds) *Living Arrangements and Family Structures - Facts and Norms*. Vienna, Austrian Institute for Family Studies.
- Björklund, A. (1992) Rising Female Labour Force Participation and the Distribution of Family Income - the Swedish Experience, *Acta Sociologica*, **35**, 299-309.
- (1993) A Comparison Between Actual Distributions of Annual and Lifetime Income: Sweden 1951-89, *Review of Income and Wealth*, **39**, 377-386.
- Blau, F. D. and Ferber, M. A. (1986) *The Economics of Women, Men and Work*. Englewood Cliffs, NJ, Prentice-Hall.

- Blossfeld, H.-P. and Rohwer, G. (1995) *Techniques of Event History Modeling*. Matwah, NJ, Lawrence Erlbaum.
- Blossfeld, H.-P. and Rohwer, G. (1997) Part-Time Work in West Germany. In Blossfeld, H.-P. and Hakim, C. (eds.) *Between Equalization and Marginalization*. Oxford, Oxford University Press, pp. 164-190.
- Bracher, M. and Santow, G. (1997) Economic Independence and Union Formation in Sweden, *Population Studies*, **52**, 275-294.
- Cancian, M. and Schoeni, R. F. (1996). Wives' Earnings and the Level and Distribution of Married Couples' Earnings in Developed Countries. Mimeo. University of Wisconsin.
- Cancian, M. and Jäntti M. (1997) Assortative Mating on Labor Market Characteristics. Unpubl. paper, Åbo Akademi University.
- Davies, H., Peronaci R. and Joshi H. (1998) The Gender Wage Gap and Partnership. *Discussion Paper in Economics* No. 6. Birkbeck College, University of London.
- Dirven, H.-J., Lammers, J. and Ultee, W. C. (1991) Working But Still Economically Dependent? Paper presented to the Research Committee on Social Stratification of ISA, Prague, June.
- Drobnic, S. and Wittig, I. (1997) Part-Time Work in the United States of America. In Blossfeld, H.-P. and Hakim, C. (eds.) *Between Equalization and Marginalization*. Oxford, Oxford University Press, pp. 289-314.
- Edin, P.-A. and Richardson, K. (1998) Swimming With the Tide: Solidarity Wage Policy and the Gender Earnings Gap. Unpubl. paper, Department of Economics, Uppsala University.
- Edwards, J. N. 1969. Familial Behavior As a Social Exchange, *Journal of Marriage and the Family*, **31**, 518-526.

- de Graaf, P. and Vermeulen, H. (1997) Female Labour -Market Participation in the Netherlands. In Blossfeld, H.-P. and Hakim, C. (eds.) *Between Equalization and Marginalization*. Oxford, Oxford University Press, pp. 191-209.
- Gustafsson, S. S. and Stafford, F. P. (1992) Childcare Subsidies and Labor Supply in Sweden, *Journal of Human Resources*, **27**, 204-230.
- Henz, U. and Sundström, M. (1998) Earnings as a Force of Attraction and Specialization. *Stockholm Research Reports in Demography* 129, Stockholm University.
- Hoem, B. (1995a) *Kvinnors och mäns liv. Del 2. Parbildning och separationer* (The lives of women and men. Part 2. Union formation and dissolution). Stockholm, Statistics Sweden.
- (1995b) *Kvinnors och mäns liv. Del 1. Sysselsättning från 17 års ålder* (The lives of women and men. Part 1. Employment from age 17). Stockholm, Statistics Sweden.
- Hoem, B. and Hoem, J. M. (1992) The Disruption of Marital and Non-Marital Unions in Contemporary Sweden. In Trussel, J., Hankinson R., and Tilton J. (eds.) *Demographic Applications of Event History Analysis*. Oxford, Clarendon Press, pp. 61-93.
- Hoem, J. M. and Rennermalm, B. (1985) Modern Family Initiation in Sweden: Experience of Women Born Between 1936 and 1960, *European Journal of Population*, **1**, 81-112.
- Joesch, J. M. (1997) Paid Leave and the Timing of Women's Employment Before and After Birth, *Journal of Marriage and the Family*, **59**, 1008-1021.
- Juhn, C. and Murphy, K. M. (1997) Wage Inequality and Family Labor Supply, **15**, 72- 97.
- Kalmijn, M. (1998) Inter-marriage and Homogamy: Causes, Patterns, Trends, *Annual Review of Sociology*, **24**, 395-421.
- Karlberg, E. (1999) Ofrivillig deltid blir allt vanligare (Involuntary part time is becoming more common), *Dagens Nyheter*, March 23, p. A13.

- Karoly, L. A. and Burtless G. (1995) Demographic Change, Rising Earnings Inequality and the Distribution of Personal Well-Being, 1959-1989, *Demography*, **32**, 379-405.
- Killingsworth, M. R. and Heckman, J. J. (1986) Female Labor Supply: A Survey. In Ashenfelter, O. and Layard, R. (eds.) *Handbook of Labor Economics*, Vol.1, Amsterdam, North-Holland, pp. 103-204.
- Lam, D. (1988) Marriage Markets and Assortative Mating with Household Public Goods: Theoretical Results and Empirical Implications, *Journal of Human Resources*, **23**, 462-487.
- Leibowitz, A. and Klerman, J. A. (1995) Explaining Changes in Married Mothers' Employment Over Time, *Demography*, **32**, 365-378.
- Leth-Sørensen, S. and Rohwer, G. (1997) Women's Employment and Part-Time Work in Denmark. In Blossfeld, H.-P. and Hakim, C. (eds) *Between Equalization and Marginalization*. Oxford, Oxford University Press, pp. 247-271.
- Maddala, G. S. (1983) *Limited-Dependent and Qualitative Variables in Econometrics*. Cambridge, Cambridge University Press.
- Mare, R. D. (1991) Five Decades of Educational Assortative Mating, *American Sociological Review*, **56**, 15-32.
- Oppenheimer, V. K. and Lew, V. (1995) American Marriage Formation in the 1980s: How Important was Women's Economic Independence? In Mason, K. O. and Jensen, A.M., *Gender and Family Change in Industrialized Countries*. Oxford, Clarendon Press, pp.105-138.
- Pedersen, P. J. and Westergård-Nielsen, N. (1993) Unemployment: A Review of the Evidence from Panel Data, *OECD Economic Studies No. 20*. Paris, OECD.
- Qian, Z. (1998) Changes in Assortative Mating: The Impact of Age and Education, 1970-1990, *Demography*, **35**, 279-292.

- Qian, Z. and Preston, S. H. (1993) Changes in American Marriage, 1972 to 1987: Availability and Forces of Attraction by Age and Education, *American Sociological Review*, 58, 482-495.
- Rønsen, M. and Sundström, M. (1996) Maternal Employment in Scandinavia, *Journal of Population Economics*, 9, 267-285.
- Schoen, R. and Weinick, R. M. (1993) Partner Choice in Marriages and Cohabitations, *Journal of Marriage and the Family*, 55, 408-414.
- Sundström, M. (1987) *A Study in the Growth of Part-Time Work in Sweden*. Stockholm, Arbetslivscentrum and Almqvist & Wiksell International.
- (1993) The Growth in Full-Time Work Among Swedish Women in the 1980s, *Acta Sociologica*, 36, 139-150.
- (1997) Managing Work and Children: Part-Time Work and the Family Cycle of Swedish Women. In Blossfeld, H.-P. and Hakim, C. (eds), *Between Equalization and Marginalization*. Oxford, Oxford University Press, pp. 272-288.
- Sundström, M. and Duvander, A.Z. (1999) Family Division of Childcare: Why Do - or Don't - Swedish Fathers Take Parental Leave? *Stockholm Research Reports in Demography* 139, Stockholm University.
- Swedish Labour Force Surveys*, Yearly averages, various years. Stockholm, Statistics Sweden.
- Weiss, Y. (1997) The Formation and Dissolution of Families: Why Marry? Who Marries Whom? And What Happens upon Divorce. In Rosenzweig, M.R. and Stark, O. (eds) *Handbook of Population and Family Economics* Vol.1A, Amsterdam, North-Holland, pp. 81-123.

Table 1 Frequencies and means for married and cohabiting women in our sample at the time of first birth according to period of first birth. Medians in parentheses.

	Married women		Cohabiting women	
	First birth before 1980	First birth 1980 or later	First birth before 1980	First birth 1980 or later
Religious parents, %	20.0	27.1	8.5	10.0
Only compulsory educ., %	31.6	16.1	46.9	17.3
University degree, %	4.6	15.8	1.9	4.9
Father blue-collar worker, %	42.4	34.4	50.0	44.4
Woman's age at 1st birth	23.1	27.1	21.5	25.3
Spouse's age at 1 <sup>st</sup> birth	26.5	30.5	25.6	28.1
Full-time experience, years	3.6	5.4	3.2	5.0
Born outside Sweden, %	19.4	19.8	7.2	3.2
Woman's highest earnings before birth, 10,000s	11.1 (11.7)	14.0 (14.4)	9.2 (9.7)	13.2 (13.6)
Spouse's earnings, 10,000s	15.3 (15.4)	17.1 (16.5)	15.0 (15.6)	16.1 (15.5)
Months lived together before first birth	33.5	56.2	26.8	39.7
Months lived together before marriage	15.3	30.4		
Max. number of observations*	475	546	375	739

Note: 'Married' means married at first birth or in the six following months. 'Cohabiting' means living with a partner at first birth without being married within six months of the first birth.

\* Some women have missing information for example on spouse's earnings.



Table 2 Correlations of spouses' annual earnings for married and cohabiting couples one year and five years after first birth by period of first birth. Pearson correlation coefficients.

Married couples

Years after birth	1968 - 1973		1974 - 1984		1985 - 1992		All	
	# obs.	Corr.	# obs.	Corr.	# obs.	Corr.	# obs.	Corr.
One	154	0.17**	388	0.19***	286	0.30***	828	0.29***
Five	206	0.11	496	0.28***	185	0.28***	887	0.25***

Cohabiting couples

One	6	†	268	0.04	132	0.13	406	0.12**
Five	19	0.48**	207	0.18***	48	-0.12	274	0.18***

Note: Couples are included in the table if they lived together one year or five years after first birth and if we observe their earnings at that time. 'Married' means married in January the first or the fifth year after first birth.

\*\*\* = significant at 1 %, \*\* = at 5 %, \* = at 10 %, two-tailed tests. † = too few observations.

Table 3 Effects of spouse's annual earnings on women's annual earnings for married and cohabiting couples one year and five years after first birth by year of first birth. Tobit-estimates. Standard errors in parentheses.

Married couples

	1968 - 1973		1974 - 1984		1985 - 1992		All	
Years after birth	#of obs.	Coeff.	# of obs.	Coeff.	# of obs.	Coeff.	# of obs.	Coeff.
One	152	0.119** (0.053)	382	0.109*** (0.034)	283	0.115*** (0.032)	817	0.115*** (0.023)
Five	200	0.019 (0.043)	487	0.090*** (0.025)	184	0.128*** (0.046)	871	0.071*** (0.020)

Cohabiting couples

One	6	†	265	-0.023 (0.039)	131	0.035 (0.044)	402	0.028 (0.030)
Five	18	0.233 (0.194)	207	0.122*** (0.036)	48	0.050 (0.078)	273	0.122*** (0.032)

Note: Couples are included in the table if they lived together one year or five years after first birth and if we observe their earnings at that time. 'Married' means married in January the first or the fifth year after first birth. We control for the woman's age, months and hours worked and age of youngest child.

\*\*\* = significant at 1 %, \*\* = at 5 %, \* = at 10 %, two-tailed. tests † = too few observations.

Table 4 Number of selected labour market transitions among women and men.

Origin	Destination	Women		Men
		total number	analysed	total
Part-time work	Full-time work	368	327	17
	Parental leave	649		5
	Non-employment	169	135	0
	Full-time education	136		3
Full-time work	Part-time work	223	184	17
	Parental leave	391		33
	Non-employment	168	124	107
	Full-time education	111		79
Parental leave	Part-time work	1411	927	10
	Full-time work	742	394	51
	Non-employment	257		1
	Full-time education	68		2
Non-employment	Part-time work	398	304	5
	Full-time work	276	182	98
	Parental leave	38		0
	Full-time education	127		19
Full-time education	Part-time work	125		3
	Full-time work	141		92
	Parental leave	12		1
	Non-employment	73		19

Table 5 Mothers' labour-market transitions: Results from piecewise-constant exponential hazard models.

Standard errors in parentheses.

	PT→FT	FT→PT	FT/PT→NE	NE→PT/FT	Leave→PT	Leave→FT
	(1)	(2)	(3)	(4)	(5)	(6)
Woman's earnings	0.052*** (0.015)	0.113** (0.057)	-0.059*** (0.016)	0.183*** (0.032)	0.122*** (0.027)	0.100*** (0.028)
Woman's earnings squared		-0.009*** (0.003)		-0.008*** (0.002)	-0.004*** (0.001)	
Spouse's earnings	-0.012 (0.008)	0.015* (0.009)	0.006 (0.009)	0.006 (0.005)	-0.001 (0.005)	-0.011 (0.008)
Spouse's earn. sq.						
Married	-0.051 (0.143)	-0.209 (0.193)	0.415** (0.176)	-0.251** (0.125)	-0.056 (0.083)	0.252* (0.147)
Age	-0.052** (0.021)	0.023 (0.025)	-0.030 (0.021)	-0.012 (0.016)	0.004 (0.016)	-0.129*** (0.028)
Schooling	0.064* (0.038)	0.048 (0.046)	-0.161*** (0.044)	0.059* (0.032)	-0.002 (0.024)	0.093** (0.038)
Work experience	-0.029 (0.021)	-0.045* (0.027)	-0.109*** (0.025)	0.008 (0.019)	-0.005 (0.017)	0.092*** (0.028)
Child < 7 years	-0.604*** (0.153)	-0.008 (0.199)				
Child < 2 years			-0.400** (0.194)	-0.501*** (0.108)		
No of children			-0.215** (0.100)	0.037 (0.063)	-0.038 (0.053)	0.190** (0.080)
Parental leave length					-0.030** (0.012)	-0.060*** (0.018)
After 1985	0.297* (0.142)	-0.040 (0.181)	0.459*** (0.145)	0.150 (0.114)	-0.446*** (0.079)	-0.407*** (0.120)
No. of duration int.	4	4	4	5	5	4
No. of transitions	327	184	259	486	927	394
No. of parameters	12	13	13	15	16	13
Likelihood ratio	54.8	49.6	166.6	220.9	1255.4	397.2

Note: FT= full time, PT= part time, NE = non-employment. Effects of duration and reference groups are excluded. Blank means that the covariate was not used in the model.

\*\*\*  $p \leq 0.01$ , \*\*  $p \leq 0.05$ , \*  $p \leq 0.10$ , two-tailed tests.

Table 6 Mothers' labour-market transitions: Parameter estimates of changes over time in effects of own and spouse's earnings. Standard errors in parentheses.

	PT→FT	FT→PT	FT/PT→NE	NE→PT/FT	Leave→PT	Leave→FT
	(1)	(2)	(3)	(4)	(5)	(6)
Woman's earnings	-0.096 (0.072)	-0.038* (0.022)	-0.073*** (0.023)	0.227*** (0.048)	0.163*** (0.040)	0.053 (0.042)
Woman's earnings squared	0.005 (0.004)			-0.009** (0.004)	-0.005*** (0.002)	0.003 (0.002)
Spouse's earnings	0.148 (0.093)	0.041*** (0.014)	0.025* (0.014)	0.001 (0.009)	0.025*** (0.008)	0.103** (0.049)
Spouse's earn. squared	-0.005* (0.003)					-0.004** (0.002)
After 1985	0.553** (0.221)	-0.073 (0.186)	0.477*** (0.165)	0.424 (0.265)	1.116*** (0.342)	0.038 (0.648)
Woman's earnings * after 1985	0.222** (0.087)	-0.041 (0.029)	0.024 (0.030)	-0.115* (0.062)	-0.130** (0.053)	0.089 (0.061)
Woman's earn.squared * after 1985	-0.007* (0.004)			0.005 (0.005)	0.004* (0.002)	-0.004* (0.002)
Spouse's earnings * after 1985	-0.166* (0.094)	-0.039** (0.018)	-0.028 (0.018)	0.008 (0.010)	-0.041*** (0.010)	-0.127** (0.054)
Spouse's earnings sq. * after 1985	0.005* (0.003)					0.004** (0.002)
Control variables as in Table 5						
No. of duration int.	4	4	4	5	5	4
No. of transitions	327	184	259	486	927	394
No. of parameters	18	14	15	18	18	19
Likelihood ratio	69.6	43.4	169.4	229.5	1283.9	409.0

Note: FT= full time, PT= part time, NE = non-employment. Effects of duration and control variables are excluded. \*\*\*  $p \leq 0.01$ , \*\*  $p \leq 0.05$ , \*  $p \leq 0.10$ , two-tailed tests.

## APPENDIX 1

### The earnings variables: definitions and missing information

#### *Definitions*

Data on annual earnings have been obtained from the national taxation register for the years 1968-92. All earnings are measured before tax and in 1992 Swedish crowns (SEK). In both our analyses earnings include income from employment, and, to a varying extent, earnings from self-employment (see below). From 1974 income from employment includes income-related and taxable transfers such as sick pay and parental-leave benefits. Before 1974 income-related transfers were not taxable and are therefore not included in the register. A person is included in the tax register in every year since his or her first income-tax return. Thus, almost all adults, including those out of the labour force, are included in the register and earnings can be zero.

We define earnings as the sum of income from employment and self-employment. However, we apply two restrictions with regard to income from self-employment. This is because, first, self-employed persons do not face the same restrictions to changing their hours of work as employees and, second, because the taxation rules for income from self-employment and employment differ which makes the two difficult to compare. For these reasons we exclude the income years from the analysis in which any of the partners had income only from self-employment (about 800 income years out of a total of about 14,000). For women we also discard about 140 income years in which their income from self-employment exceeded SEK 50,000. In the analysis of correlations between spouses' earnings, men's earnings are treated in the same way as women's. In the transition models, on the other hand, spouse's income, may, in addition to income from employment, include income from self-employment of any amount. We do so in order to approximate wages for women and income for spouses following the practice in labour supply

studies. Earnings are measured for every calendar year. The earnings covariates used in the estimations are the earnings in the year prior to the calendar year at risk, which means that they are time-varying.

***Missing data and possible selectivity***

Both analyses are restricted to the 2,135 mothers who lived with a partner at the birth of their first child (or began living with their partner within two months of the birth). The analysis of earnings correlations is based on the couples for whom earnings information is available for the first year after childbirth (1,234 couples) or for the fifth year after birth (1,061 couples), respectively. For 820 couples earnings information is available for both points in time. There are three main reasons for this rather high loss of information: First, the analysis does not include all mothers who lived with a partner at first birth due to the sample design. Hence, we have no information on earnings in the first year for children born before 1967 and in 1992 (118 cases), nor in the fifth year for children born before 1971 and after 1987 (790 cases). Also, as our analysis applies to couples it ends at separation. Separation may occur before the first year after childbirth (73 cases) or before the fifth year (199 cases). While the fact that our earnings data are restricted to the years 1968-92 is unlikely to affect our result, loss of data due to separation is more likely to do so. That correlations may differ between couples intact one year after first birth and those intact after five years is, on the other hand, a part of the process we study. We do, however, report earnings correlations separately for couples for whom we have data for both the first and the fifth year after first birth (see note 7).

Secondly, in some cases we miss information on spouse's earnings because the tax authorities were late in linking the partners' information. Spouses' earnings should be linked to the respondent's file in the year after marriage or childbirth, but in practice it has often been done in the second year or later. If we ignore censoring due to interview or union dissolution, data on spouse's earnings are missing for 33.3 percent of all couples in the first year after the first birth, but the percentage drops in the subsequent years to 21.4 (year two), 18.5 (year three), 15.7 (year four), and 15.0 percent (year five). The missing

information applies primarily to cohabitants, but also to married couples who married shortly before childbirth. This is one reason why we analyse earnings correlations separately for married and cohabiting couples. As we have no reason to expect this time-lag to be selective, it should not affect our results.

Thirdly, we lack information on own earnings for some women. For example, 132 women were not in the tax register in the year they had their first birth, which indicates that they had not previously been employed in Sweden; 94 of these women were immigrants. Immigrants may therefore to some extent be underrepresented in our analysis. There are also some cases of missing data on own and spouse's earnings after the first entry into the tax register, that is, 'holes' in the earnings history (see below).

In the analysis of women's labour-market transitions we follow their labour-market activities from January of the year in which they turned 17 or from first birth, whichever occurred later. The observation ends either at separation from the partner or at interview, whichever occurred earlier. We exclude women who had their first birth outside Sweden (90), those who were never employed (21) and those who did not report any work interruption after childbirth (56) as well as a few cases (5) of inconsistent information. This leaves us with a sample of 1,959 women. For these women we analyse the segments of their employment histories for which earnings data on both spouses are available. We have already described the missing earnings information shortly after childbirth. Temporary or permanent 'holes' in the earnings history are less common. For individuals who had only one year of missing earnings information we have replaced the 'hole' by the average of earnings in the previous and the subsequent year (30 cases of own earnings and 19 cases of spouse's earnings). Still, there remain 80 such cases for women and 374 cases for men.



**APPENDIX 2 Table A** Person-months at risk for selected characteristics. Percent.

	full-time work	part-time work	parental leave	non- employment
Total person-months at risk	42109	68567	18602	24091
17-24 years	9	6	13	25
25-29 years	23	26	42	38
30-34 years	30	35	33	25
35 years or older	38	33	12	12
Spouse earn 0 - 140,000	19	19	21	30
Spouse earn 140,000 - 170,000	26	26	27	27
Spouse earn 170,000 - 200,000	25	24	22	23
Spouse earn 200,000 -	31	32	30	20
Own earnings 0 - 50,000	9	11	8	71
Own earnings 50,000 - 100,000	19	47	36	20
Own earnings 100,000 - 150,000	40	35	41	9
Own earnings 150,000 -	31	7	15	1
Compulsory schooling	22	21	15	40
Compulsory sch. + vocational training	19	19	12	25
2 years of upper-secondary education	20	24	29	14
3-4 years of upper-secondary educ.	12	10	11	9
Tertiary education	27	26	32	12
Work experience max 1 year	1	1	2	13
Work experience 1-5 years	16	18	26	49
Work experience 5-10 years	37	48	52	32
Work experience more than 10 years	46	33	20	6
Married	83	81	80	87
1 child	32	28	25	25
2 children	50	56	53	51
3 or more children	17	17	23	25
Youngest child <2years	15	17	96	43
Youngest child 2-3 years	14	17	2	18
Youngest child 3-6 years	29	34	1	29
Youngest child 6 years or older	43	32	0	11
Birth cohort 1949	50	46	25	54
Birth cohort 1954	32	33	36	23
Birth cohort 1959	13	17	27	16
Birth cohort 1964	4	4	11	5
Birth cohort 1969	1	0	1	1
1984 or earlier	36	36	41	67
1985 or later	65	65	59	34

Table B Mother's labour market transitions: results from piecewise-constant exponential hazard models with squared earnings effects. Standard errors in parentheses.

	PT→FT	FT→PT	FT/PT→NE	NE→PT/FT	Leave→PT	Leave→FT
	(1)	(2)	(3)	(4)	(5)	(6)
Woman's earnings	0.041 (0.036)	0.114** (0.057)	-0.089** (0.035)	0.183*** (0.032)	0.120*** (0.027)	0.115*** (0.028)
Woman's earn. squared	0.000 (0.001)	-0.009*** (0.003)	0.002 (0.002)	-0.008*** (0.002)	-0.004*** (0.001)	-0.001 (0.001)
Spouse's earnings	-0.016 (0.015)	0.012 (0.009)	-0.000 (0.000)	0.0021 (0.009)	0.006 (0.012)	-0.009 (0.017)
Spouse's earn. sq.	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)
Married	-0.051 (0.143)	-0.208 (0.193)	0.407** (0.176)	-0.250** (0.125)	-0.058 (0.084)	0.254* (0.147)
Age	-0.052** (0.021)	0.023 (0.025)	-0.031 (0.022)	-0.012 (0.016)	0.004 (0.016)	-0.128*** (0.028)
Schooling	0.064* (0.038)	0.048 (0.046)	-0.161*** (0.044)	0.060* (0.032)	-0.002 (0.024)	0.090** (0.038)
Work experience	-0.030 (0.021)	-0.045* (0.027)	-0.107*** (0.025)	0.009 (0.019)	-0.006 (0.017)	0.089*** (0.028)
Child < 7 years	-0.604*** (0.153)	-0.008 (0.199)				
Child < 2 years			-0.386** (0.195)	-0.503*** (0.108)		
No of children			-0.214** (0.100)	0.038 (0.063)	-0.039 (0.053)	0.191** (0.080)
Parental leave length					-0.029** (0.012)	-0.060*** (0.018)
After 1985	0.300** (0.142)	-0.040 (0.181)	0.471*** (0.145)	0.146 (0.114)	-0.448*** (0.079)	-0.409*** (0.119)
No. of duration int.	4	4	4	5	5	4
No. of transitions	327	184	259	486	927	394
No. of parameters	14	14	15	16	16	15
Likelihood ratio	55.0	49.6	167.8	221.2	1255.9	397.5

Note: FT= full time, PT= part time, NE = non-employment. Effects of duration and reference groups are excluded. Blank means that the covariate was not used in the model.

\*\*\*  $p \leq 0.01$ , \*\*  $p \leq 0.05$ , \*  $p \leq 0.10$  two-tailed tests.