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Forschungsinstitut
zur Zukunft der Arbeit
Institute for the Study
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ABSTRACT

Is Part-time Employment Here To Stay? Evidence from the Dutch Labour Force Survey 1992–2005*

To balance work and family responsibilities, the Netherlands have chosen a unique model that combines a high female employment rate with a high part-time employment rate. The model is likely to be the result of (societal) preferences as the removal of institutional barriers, like lower marginal tax rates for partners and better childcare facilities, has not led to more working hours. It is, however, an open question whether the model is here to stay or whether younger generations of women will choose full-time jobs in the near future. We investigate the development of working hours over successive generations of women using the Dutch Labour Force Survey 1992-2005. We find evidence of an increasing propensity to work part-time over the successive generations, and a decreasing propensity to work full-time for the generations born after the early 1950s. Our results are in line with results of studies on social norms and attitudes as they find a similar pattern over the successive generations. It therefore seems likely that without changes in (societal) preferences the part-time employment model is indeed here to stay for some more time.

JEL Classification: J16, J22

Keywords: female labour supply, working hours

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1 Introduction

Many countries have experienced a strong increase in the employment rate of women. The societal models that facilitate the employment of women vary however substantially between countries. While, for example, the Scandinavian countries offer parental leave and subsidized childcare facilities, a country like the US leaves childcare to the market. The Netherlands have chosen a model that seems unique: women have a high rate of employment, but the majority of women work part-time. An advantage of part-time employment is that it allows individuals to balance work and family and care responsibilities. It is, however, an open question whether the model will stand the test of time. Or, in other words, is the Dutch part-time employment model a temporary phenomenon that facilitates the employment of the current generations of women, whereas younger generations may choose full-time employment in the near future?

The social desirability of part-time employment has become under discussion again in recent years. One aspect of the public discussion is that the less than full use of the human capital of women may harm the emancipation of women (Mees, 2006). Another aspect is that a higher participation rate and more working hours of women may be a partial solution to the problems of the sustainability of the welfare state due to the ageing of the population (Social and Economic Council of the Netherlands, 2006). Therefore the issue of part-time employment is clearly back on the political agenda and the Dutch model of part-time employment may come under pressure in the near future.

In the past, many studies emphasized the negative aspects of part-time employment (OECD, 1990, 1995, Leppel and Clain, 1988, Blank, 1989, Tilly, 1995). The research concentrated on the 'underemployed', i.e. those who do work but would like to work more hours. Several recent studies emphasize however that part-time employment may at least be partly the result of individual and household preferences (OECD, 2001, 2002, 2004, Jaumotte, 2003, SCP, 2006). On the basis of a comparison between Finland and Germany, Pfau-Effinger (1993) argues that the employment behaviour of women is largely determined by country-specific cultural norms and values, which in turn may also influence the development of institutions. Part-time work may then not simply be the result of institutional factors as these factors may be chosen such that they facilitate part-time employment. This may be particularly true for the Dutch model. The research in the current study is also inspired by a historical development in Sweden. Like in many other countries, the employment rate of Swedish women increased strongly during the last few decades. Sundström (1991) shows that while the proportion of women in part-time employment increased until the mid 1980s, the proportion decreased from that period onwards. She concludes that part-time work improved the labour force attachment of Swedish women, strengthened their position on the labour market and reduced their economic dependency. So

part-time work turned out to be a temporary phenomenon that facilitated the employment of a certain generation of women. Nowadays most Swedish women work full-time. Therefore the central question is: may we expect a similar development in the Netherlands?

This study uses a sample of women drawn from the Dutch Labour Force Survey 1992-2005 to investigate the incidence of part-time and full-time employment over age, period and cohort. We are particularly interested in the development over cohorts as this will say something about the propensity of the youngest generations to work full-time. The emphasis on the differences among cohorts, or generations, implies that we abstract from other interesting and undoubtedly important aspects of female labour supply, like the impact of tax and child care policies and the interaction with male labour supply. We apply empirical regressions models to disentangle the impact of age, time and cohort, and of other exogenous individual and family characteristics on the propensity of women to work part-time or full-time. The empirical analysis reveals that the propensity to work part-time increased strongly over the successive generations. The propensity to work full-time increased until the generation born in the beginning of the 1950s, while for the younger generations the propensity decreased. In particular the result on full-time employment is in line with results on social norms and attitudes (SCP/CBS, 2006). The number of individuals with a negative attitude towards women combining work and family life decreased strongly until the generation born in the beginning of the 1950s, while from that generation onwards the attitude stayed rather stable. And even more, there is some evidence that the younger generations are becoming slightly more conservative than the generation of the 1950s. It seems therefore likely that without changes in attitudes and (societal) preferences the part-time employment model is indeed here to stay for some more time.

The remainder of the study is organised as follows. Section 2 discusses national policy and the international position of the Dutch part-time employment model. Section 3 discusses the data. Section 4 discusses the estimation strategy and the results. And finally, section 5 concludes.

2 The Dutch model

The Dutch labour market shows a high rate of part-time employment and the rate continues to grow fast (OECD, various issues). In particular women work part-time, although compared to other countries many men work part-time as well. This section deals with two questions: was national policy important for the growth of part-time employment? And how special is the Dutch model of part-time employment in a cross-national comparison?

2.1 National policy

Already since the end of the 1980s, Dutch policy makers recognised that part-time employment may be a way for workers to balance work and other (family and care) responsibilities. The government implemented policies to protect and even enforce the position of part-time workers. What role did these policies play? And did other policies like the tax system and child care provisions play an important role?

The Dutch government implemented several laws and policies that were aimed at part-time employment. In 1993, the government reinforced the legal position of part-time workers by extending the applicability of the statutory minimum wage and the minimum holiday allowance. Previously, these rights did not apply to employees working less than one-third of normal full-time hours. In 1996, the government installed a law that gave part-time workers an explicit right to equal treatment – pro rata – on wages, overtime payments, bonuses and training. In 2000, the government even awarded workers the right to request an upward or downward adjustment of the number of working hours within their current job, which employers have to honour unless there are conflicting business interests.

Did the policies on part-time employment lead to a larger increase in the part-time employment rate? Evidence from macro-panel data for 15 EU countries suggests that policy does have an impact on the part-time employment rate, but the impact for the Netherlands is not found as part-time work increased before policies were implemented (Buddelmeyer *et al.*, 2008). Moreover, evaluations show that the law of 2000 did not affect the adjustments of working hours within a given job, and job mobility remained to be the major channel to adjust working hours (Fouarge and Baaijens, 2004).[2] As the rate of part-time employment started to increase before the policies were implemented in the Netherlands, it seems likely that the policies followed an already existing practice.

While human capital characteristics like education and experience determine the gross wage of a worker, the tax system codetermines the net return to paid employment. The Netherlands reformed their tax system during the last decades, partly to provide more incentives for women to become engaged in paid employment. The reforms clearly lowered the marginal tax burden of the second earner of the household and therefore increased the incentive to employment. Simulation studies (Graafland and De Mooij, 1998, van Soest and Das, 2001) and an empirical evaluation study (Euwals, 2008) show that the tax reform of 2001 increased participation. The

[2] Germany introduced a similar law in 2001, and evaluation shows that also in Germany the new law did not affect the adjustments of working hours within a given job (Munz, 2004).

reform however made employment more attractive against non-employment, while part-time employment did not become more attractive relative to full-time employment. Note that in some countries part-time employment is relatively attractive as the tax system contains a tax credit that is phased in at low incomes and phased out at higher incomes. Examples are the Earned-Income Tax Credit (EITC) in the US and the Working Families Tax Credit (WFTC) in the UK (Blundell, 2006). The Netherlands however never had such a tax credit, and it is only the current Dutch government which plans to introduce it.

The limited availability and affordability of child care constituted an obstacle for female labour supply during the 1980s and 1990s. The limited access to child care facilities restricted the possibilities of women with children to work full-time, and this is regularly mentioned as a major explanation for the high rate of part-time employment in the Netherlands (Visser, 2004). In recent years, the availability is not that restricted anymore while the affordability improved because of the introduction of a new law on child care in 2005 ('Wet Kinderopvang'). Nowadays, the government subsidises families with child care expenses directly. The subsidy varies from about one third of the costs for high-income families to almost a full hundred percent for low-income families (Jongen, 2008). Recent survey studies conclude that quality of the child care is important as two third of all mothers regard formal child care as less favourable (SCP, 2006).

2.2 International position

How exceptional is the Dutch model that combines a relatively high female participation rate with a high incidence of part-time employment? A major policy issue is how to combine female employment with family and care responsibilities. Many countries have a high female participation rate, but the solutions chosen to solve the dilemma vary over the countries.

The Scandinavian model combines a high female participation rate with a reasonably high fertility rate (table 2.1). Many women work full-time, and the Scandinavian countries clearly facilitates the combination of employment and care responsibilities by providing public child care provisions and/or maternity pay entitlements. France has a somewhat lower female employment rate, but with respect to child care facilities, part-time employment and fertility the country is rather similar to these countries.

The Anglo-Saxon model typically leaves child care to the market. Nevertheless have countries like the UK and Australia labour market outcomes that come close to the outcomes for the Netherlands. These countries do not particularly well on the index for child care facilities, but the part-time employment rate and the fertility rate are reasonably high. A major difference with

the Netherlands is however that the UK and Australia did not implement policies that gives all workers the right to adjust working hours according to their own preferences (section 2.1). Still discussions on the combination of work and family life take place in the UK as well (Gregory and Connoly, 2008, Manning and Petrongolo), and the country implemented equal treatment policies and awarded parents of children aged under six or disabled under 18 the right to apply to work flexible.

The continental and southern European countries have not solved the dilemma on combining female employment and care responsibilities. The countries hardly offer childcare facilities, the market does not provide it, and part-time employment is not common. The repercussions on female employment and fertility are clearly visible from the figures as both belong to the lowest among the OECD countries.

Table 2.1 Female participation, female part-time employment, child care, fertility, various countries

	Participation [a]	Part-time [b]	Child care [c]	Fertility [d]
	%	%		
Sweden	77.7	19.0	4.0	1.6
Denmark	76.7	25.6	4.4	1.8
Finland	73.2	14.9	1.5	1.7
UK	70.3	38.8	– 0.9	1.7
Netherlands	69.4	59.7	0.3	1.7
US	69.3	17.8	0.1	2.0
Australia	69.0	40.7	– 2.6	1.8
Germany	68.5	39.2	– 0.6	1.3
France	63.9	22.9	1.7	1.9
Spain	61.1	21.4	– 0.4	1.2
Belgium	58.9	34.7	1.2	1.7
Italy	50.8	29.4	0.4	1.3
EU-15[e]	64.2	31.7		

[a] Labour force participation rate of women, age 15-64, 2006, OECD Employment Outlook 2007.
[b] Part-time employment rate of working women, 2006, OECD Employment Outlook 2007.
[c] Index for child care coverage and maternity pay entitlement, scale from – 5 to 5, columns 1 to 3 of Table 4.9, OECD Employment Outlook 2001.
[d] Total fertility rate (children per woman), 2000-2005, World Population Prospects, The 2004 Revision, UN 2005.
[e] Belgium, Germany, Finland, France, Greece, Ireland, Italy, Luxemburg, the Netherlands, Austria, Portugal, Spain, Denmark, United Kingdom and Sweden.

3 Data

The data are taken from the Dutch Labour Force Survey (DLFS) 1992-2005. The survey is a stratified random sample of about 1% of the population of Dutch inhabitants aged 15 and older,

excluding those living in institutions like nursing homes and prisons. Every year a new random sample is drawn, implying that the survey exists of repeated cross-sections. The DLFS contains detailed demographic and employment information: the employed provide information on their jobs (but not on wages), while the non-employed provide information on job search activities. We select a sample of women aged 18 to 64 containing about 35 000 observations per year.

3.1 Descriptive statistics

As we plan to disentangle the impact of age, period and cohort on working hours, the number of observations per age, period or cohort cell matters. The youngest age in the sample is 18, while the oldest age is 64. In our sample, each year of age has about 10 000 observations. The first cohort included in the data was born in 1928, while the latest cohort was born in 1987. Each cohort (by year of birth) contains about 8 000 observations. Only the youngest and oldest age and cohort groups contain fewer observations, as for example women born in 1987 were 5 years old in 1992, which is the beginning of our period of observation. And for the oldest women mortality also starts to play a role.

The statistics on demographics are in line with the current trends in society, like the ageing of the population and the individualisation of society (see table 3.1). The average age in the sample increases from 39.1 in 1992 to 41.9 in 2005. The number of married women decreases, while the number of cohabiting women increases over time. The number of minor children remains rather constant over time, which is in line with the fact that fertility was rather constant over the last decades. Furthermore, educational attainment of both women and their partners increased steadily over time. According to the latest figures on educational attainment, the youngest generation of women has succeeded in acquiring a higher level of education than their male counterparts. Note furthermore that unemployment was rather low in the 1990s, and that in particular the unemployment rate among married and cohabiting men was very low.

3.2 Part-time employment and working hours

The long time-span of the DLFS offers the opportunity to draw figures on the development of part-time employment and working hours over period and age per cohort. For this purpose, we need to define part-time and full-time in terms of working hours. First, we define full-time employment as working 35 hours or more per week. According to the official definitions laid down in sector-specific collective agreements, a full-time working week contains 36, 38 or 40 working hours per week in almost all sectors. But the lowest possible number of working hours per week in a full-time job is 35 hours. As we do not to observe the official full-time working week of the respondents in our data source we define a general threshold for a full-time working

week of 35 hours per week. For the large part-time jobs we use 25 hours per week as the threshold. In the Netherlands, many women work exactly 24 hours per week. We do not want to categorize these women as having a large part-time job. Next, for the small part-time jobs we use 12 hours per week. This number follows naturally from the definitions of the official statistics for the Netherlands. For example, according to the official definition an individual is unemployed in case he does not work or does work less than 12 hour per week *and* he wants to work 12 or more hours per week.

Figure 3.1 and 3.2 show the age and cohort profiles of women working part-time or full-time. The proportion of women working less than 12 hours per week remains rather constant over the successive cohorts (figure 3.1, left panel). The proportion of women working full-time reveals a typical development over age (figure 3.2, right panel): while the full-time employment rate is rather high until age 25, the rate decreases rapidly from that age onward and stays constant from age 35 to 50. This timing seems to coincide with the birth of the first child, which happens on average at age 29 in the Netherlands. The figure also reveals that the incidence of full-time employment does not seem to increase over the successive generations: at a given age, the full-time employment rate is similar for the different cohorts.

The female participation rate increased substantially over the last decades, and the figures show what kind of jobs became more important in numbers: the part-time jobs. Both the proportion of small part-time jobs (figure 3.1, right panel) and large part-time jobs (figure 3.2, left panel) consistently increased over the successive generations. That is to say, at a given age the younger cohorts have a higher part-time employment rate than the older generations.

Figure 3.3 shows both the age and cohort profile of the number of working hours of women with a job. Around age 26 the number of working hours reaches a maximum on average, while afterwards the number of working hours declines. From age 35 to 55 the average working hours remain rather stable at about 25 hours. There is no clear cohort effect visible: at a given age the different cohorts have a similar number of working hours. The previous two figures showed that the proportion of small part-time jobs (12-24 hours) and large part-time jobs (25-34 hours) increased over time. So the non-existence of a cohort effect in the average working hours is explained by the fact that the cohort effects in the two types of part-time jobs cancel out.

On average, full-time working women are young, are not married, have no children and are highly educated (Appendix A). Part-time working women are, on average, somewhat older, are married and have young children. Their level of education is only slightly lower than for full-time working women. At the same time, many highly educated women work part-time. Note that the analysis in this chapter is purely descriptive, it does not disentangle the impact of age,

period, cohort and other individual characteristics. Furthermore, changing cohort characteristics may be important as well. The next section will take these considerations into account by applying multiple regression methods.

Table 3.1 Summary statistics, women age 18-64, in years or percentages [a]

Period (year)	1992	1995	2000	2005	All years
Age	39.1	40.0	41.0	41.9	40.7
Cohort (year of birth)	1953	1955	1959	1963	1958
Household position					
Married	61.9	61.5	59.1	56.0	59.3
Cohabiting, been married	1.4	1.7	2.1	2.3	2.0
Cohabiting, never been married	8.2	9.5	11.6	12.3	10.8
Single, been married	9.2	9.2	9.4	10.5	9.7
Single, never been married	9.0	9.1	9.5	9.7	9.3
Living with parents	8.9	7.8	7.0	7.8	7.5
Other	1.3	1.2	1.4	1.5	1.2
Children					
Age youngest child 0-3	13.1	12.9	13.3	12.7	13.0
Age youngest child 4-11	13.4	13.4	14.2	14.4	14.0
Age youngest child 12-17	9.9	9.3	8.6	9.3	9.1
Two minor children	15.4	15.7	15.7	16.0	15.7
Three or more minor children	6.7	6.7	6.5	6.2	6.6
Major children	16.8	15.3	13.5	14.0	14.3
Level of education					
Primary	17.8	15.4	14.7	9.0	13.3
Lower secondary	29.5	28.5	25.0	24.3	26.5
Higher secondary	36.9	38.3	39.4	42.0	39.8
Tertiary	15.8	17.9	20.9	24.7	20.3
Type of education					
General	36.5	33.8	31.9	31.8	32.8
Technical	5.7	5.7	5.6	7.3	6.2
Economic	16.3	17.3	18.3	16.6	17.5
Health care	41.5	43.2	44.2	44.2	43.5
Partner characteristics					
Age	43.0	44.0	45.2	46.4	44.9
Primary education	14.5	12.6	12.4	7.2	10.9
Lower secondary education	22.3	21.2	19.5	18.8	20.5
Higher secondary education	41.2	42.6	40.9	43.1	42.0
Tertiary education	22.0	23.7	27.1	30.9	26.6
Unemployed	1.7	2.2	0.9	2.0	1.5
Number of observations	38257	43546	39744	41349	514986

[a] Weighted summary statistics.

Figure 3.1 **Part-time employment, 1-11 hours (left panel) and 12-24 hours (right panel) per week by age and cohort, women age 18-64, in percentage** [a]

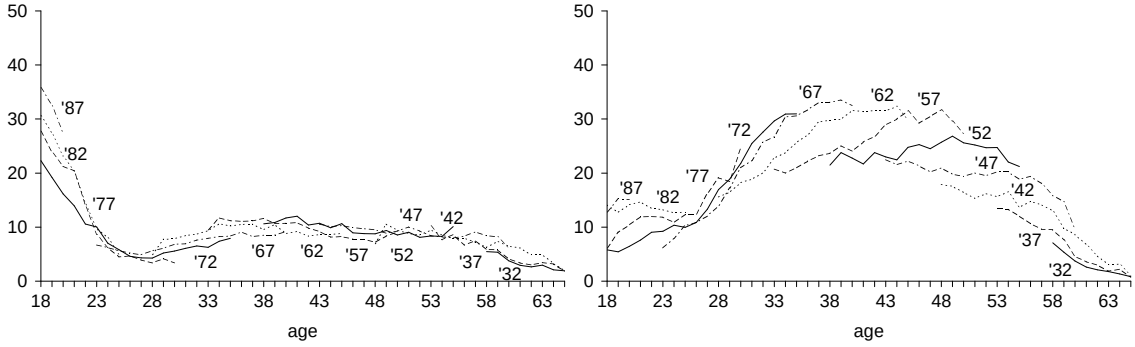


Figure 3.2 **Part-time employment, 25-34 hours (left panel) and 35 or more hours per week (right panel) by age and cohort, women age 18-64, in percentage** [a]

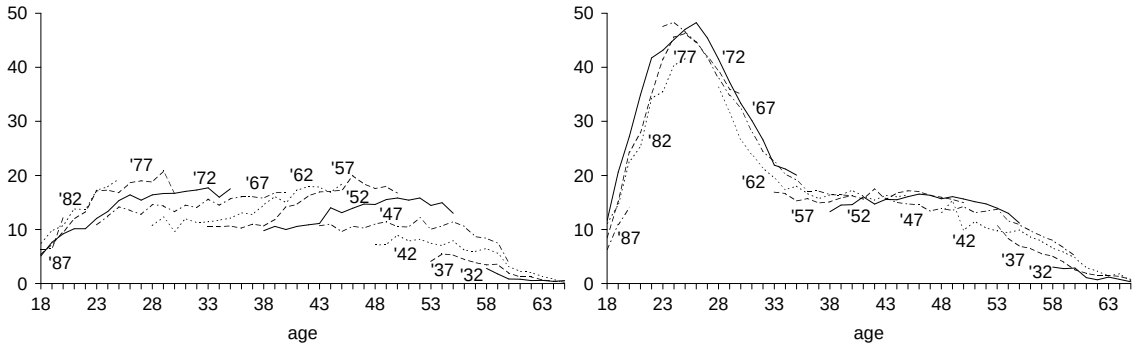
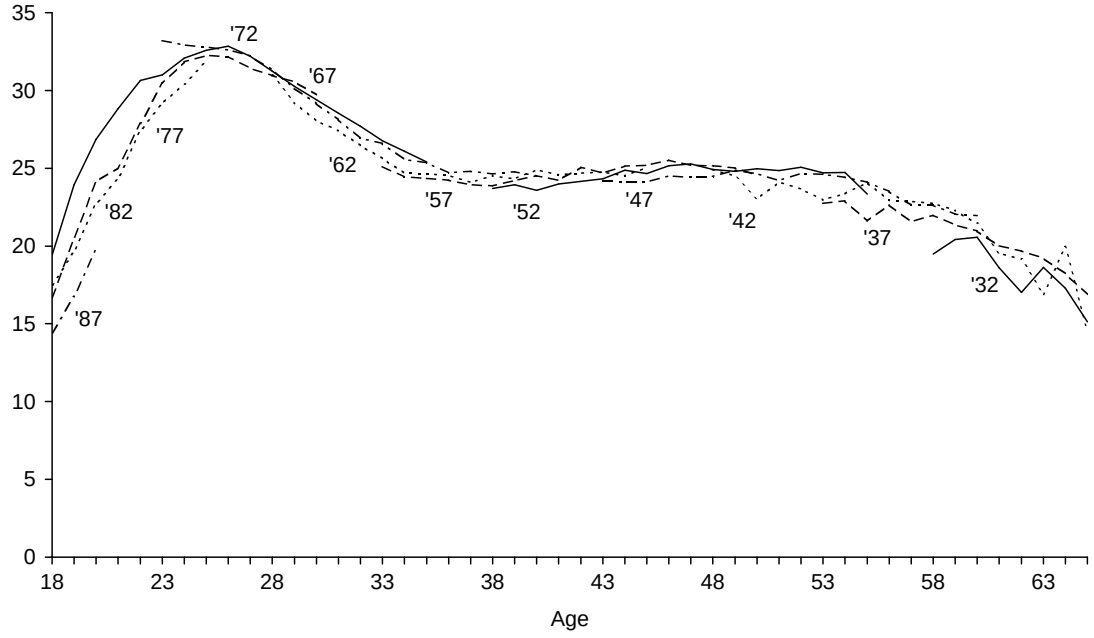


Figure 3.3 **Average working hours per week by age and cohort, working women age 18-64** [a]



[a] Cohorts in 5-year groups, from cohort with year of birth 1985-1989 (left in figure) to cohort with year of birth 1930-1934 (right in figure).

4 Empirical strategy and results

In this section, we apply regression techniques to disentangle the impact of age, period and cohort, and of other exogenous individual and family characteristics on the development of the part-time and full-time employment rate over time. The results will be used to draw conclusions on the propensity of the youngest generations to work part-time or full-time.

4.1 Empirical model for age, period and cohort

This section specifies an empirical model to estimate the determinants of the incidence to work part-time or full-time. Indicating individual *i* and time *t* by corresponding subscripts our model specifies the endogenous variable y_{it}^{*} ,which may be the propensity to work part-time or full-time $(y_{it}^{*} = p_{it}^{*})$, or which may be the working hours $(y_{it}^{*} = h_{it})$ The reduced form model:

$$y_{it}^{*} = \beta_0 + \beta_1 x_{it} + g_a(a_{it}|\theta_a) + g_c(c_i|\theta_c) + g_t(t|\theta_t) + \varepsilon_{it}$$

where x_{it} is a vector of variables including individual and family characteristics, a_{it} denotes age, c_i denotes cohort and t denotes year. The g_a , g_c and g_t are functions corresponding to age, cohort and year effects. The vector $\theta = (\beta_0, \beta_1, \theta_a, \theta_c, \theta_t)$ contains parameters.

A well-known complication of the model is that not all parameters can be identified whenever the functions for age, period and cohort contain a linear term. The reason is that whenever both the birth year and the age of an individual are known then the current year is known as well, i.e. age, period and cohort are linearly dependent. Several ways have been suggested to circumvent this identification problem. Probably the most straightforward way is to omit an entire function altogether, and replace it by some other variable, or set of variables, which are thought to represent the concerning effects well. This procedure is often called the proxy variable approach, see for example Portait *et. al* (2002). In the current case, we will include a variable which represents the period effects of female labour supply. For instance, if period effects are thought to be the consequence of macroeconomic circumstances that impact the probability to be employed, then a logical proxy variable would be the aggregate unemployment rate. We will use the aggregate unemployment level by level of education. The accompanying study Euwals *et al.* (2007) discusses the issue in more detail in the context of female labour supply. In this study we adopt the conclusion that the proxy variable approach is a credible solution to the identification problem.

Before turning to the application of the model, two aspects should be clear. First, the model cannot be interpreted as a structural labour supply model (Blundell and MaCurdy, 1999) as

wages and other non-labour income are not included in the model. The reason is that wages and other non-labour income are not observed in our dataset. We discuss the consequences of missing this information in more detail in the last section. Second, the model assumes that the age, period and cohort effects are independent of each other, and that they do not interact with the other observed individual characteristics. This may be a restrictive assumption, as for example the cohort effects may vary by household type. Section 4.4 will present some sensitivity analysis to accommodate this concern.

The empirical model will be applied to the probability that the working hours of a woman fall into a specific range of working hours. We use the categories as defined in section 3.2, that is 1-11 hours, 12-24 hours, 25-34 hours and 35 hours and more. We estimate logit models per category or cumulative range (see below). It may be tempting to estimate ordered logit models as there is natural ordering in the working hours. However, this natural ordering does not make sense in case one considers optimal labour supply behaviour: a woman may prefer to work a certain number of hours, and working more or less than this particular number of hours does make her less well off. So in a utility optimisation framework there is no natural utility ordering in the number of working hours. Therefore an ordered model is likely to be overly restrictive.

After estimating this model, we will make a decomposition of the growth in the probability to work full-time or part-time. We denote the probability by q_t (skipping the categories of working hours and the individual subscript). The marginal effect of explanatory variable x_j equals:

$$\frac{\delta q_t}{\delta x_j} = q_t(1-q_t)\beta_j$$

The change in the probability depends on all explanatory variables. How much each of these explanatory variables contributes to the change at time t is approximated by:

$$e_{jt} = \bar{q}_t(1-\bar{q}_t)\beta_j \Delta \bar{x}_{jt}$$

where $\bar{q}_t$ denotes the predicted probability that an 'average' female at time t is working a certain number of hours. The variable $\bar{x}_{jt}$ denotes the average value of an explanatory variable.

Table 4.1 **Marginal effects for probability to work at least a certain number of hours (in percentage-points) or working hours, women age 18-64** [a,b,c,d]

	≥ 1 hour		≥ 12 hours		≥ 25 hours		≥ 35 hours		Working hours	
	Marg. effect	Std. error	Marg. effect	Std. error	Marg. effect	Std. error	Marg. effect	Std. error	Marg. effect	Std. error
Position in household										
Married										
Cohabiting, been married	4.9	0.6	9.2	0.6	12.5	0.6	7.4	0.4	3.6	0.1
Cohabiting, never been married	11.4	0.4	15.2	0.4	14.5	0.3	6.6	0.2	3.1	0.1
Single, been married	– 6.3	0.8	– 0.2	0.8	7.1	0.8	6.0	0.6	5.7	0.3
Single, never been married	– 3.1	0.8	2.6	0.9	13.3	0.9	11.3	0.8	6.8	0.3
Living with parents	7.5	0.8	17.2	0.9	25.6	1.1	18.6	1.0	9.3	0.3
Other	– 2.6	1.1	6.5	1.1	15.4	1.2	12.3	1.0	8.1	0.3
Children										
No children										
Age youngest child 0-3	– 35.8	0.7	– 35.8	0.5	– 24.2	0.3	– 12.3	0.2	–10.1	0.2
Age youngest child 4-11	– 21.7	0.8	– 27.1	0.7	– 20.2	0.4	– 10.3	0.2	– 8.6	0.2
Age youngest child 12-17	– 6.9	0.8	– 10.9	0.7	– 10.9	0.4	– 6.1	0.3	– 5.0	0.2
Two minor children	– 9.8	0.8	– 13.5	0.7	– 9.2	0.5	– 4.4	0.4	– 2.9	0.2
Three or more minor children	– 17.1	1.0	– 22.1	0.8	– 9.7	0.7	– 4.5	0.5	– 3.6	0.3
Major children	– 2.7	0.3	– 5.1	0.3	– 3.9	0.2	– 2.2	0.1	– 1.7	0.1
Interactions with single	yes	**	yes	**	yes	**	yes	**	yes	**
Interactions with period	yes	**	yes	**	yes	**	yes	**	yes	**
Level of education										
Primary										
Lower secondary	16.9	0.6	16.2	0.7	9.5	0.6	4.8	0.4	– 0.2	0.2
Upper secondary	26.8	0.6	22.5	0.6	12.3	0.6	5.6	0.4	– 1.1	0.2
Tertiary	32.1	0.5	30.5	0.7	20.3	0.7	9.3	0.5	0.1	0.2
Type of education										
General										
Technical	– 2.7	0.4	– 1.4	0.4	3.8	0.3	2.5	0.2	1.4	0.1
Economical	4.8	0.3	7.6	0.3	8.4	0.3	5.4	0.2	2.2	0.1
Care	2.7	0.3	2.1	0.3	1.1	0.2	– 1.7	0.1	– 0.6	0.1
Partner characteristics										
Age difference partners	yes	**	yes	**	yes	**	yes	**	yes	**
Level of education	yes	**	yes	**	yes	**	yes	**	yes	**
Interaction education partners	yes	**	yes	**	yes	**	yes	**	yes	**
Partner unemployed	– 10.9	0.6	– 6.7	0.6	2.0	0.5	2.1	0.4	2.0	0.2
Age										
Dummy variables	yes	**	yes	**	yes	**	yes	**	yes	**
Period (year)										
Unemployment	– 0.5	0.1	– 0.8	0.1	– 0.6	0.0	– 0.3	0.0	– 0.2	0.0
Cohort (year of birth)										
Dummy variables	yes	**	yes	**	yes	**	yes	**	yes	**

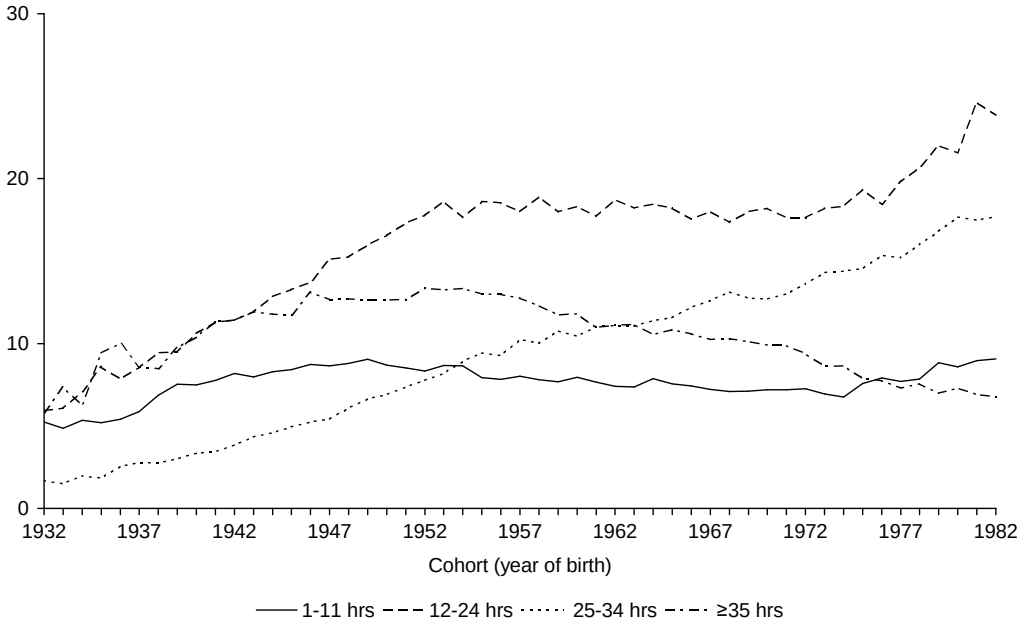
[a] The models for the probability to work at least a certain number of hours per week are estimated by logit, while the model for the working hours is estimated by ordinary least squares.

[b] The reference group contains married women without children and with a primary level of education.

[c] The results on age, period and cohort effects are presented by means of figure 4.1, the interaction effects on children and partner characteristics are presented in Appendix B.

[d] Estimation results marked with * or ** are jointly significant at a 10 and 5 percent significance level.

Figure 4.1 Average probability to work part-time or full-time by cohort, women age 18-64, in percentage [a]



[a] For all characteristics, the mean of the data are taken, except for the cohort dummies. Marginal effects and standard errors of the cohort dummies are available upon request with the authors.

4.2 Part-time employment of all women

In this section, we turn to the estimation results for our model, which explains the probability that a woman works at least a certain number of hours per week. We use cumulated ranges of working hours to enable an unambiguous interpretation. The interpretation of the estimation results for the probability to work part-time would be more difficult as the alternative category would contain both non-employment and full-time employment.

The presence of children significantly reduces the probability to be in a full-time job, especially when the children are young (table 4.1). The marginal effect of the presence of a young child is larger for working 12 hours or more than for working 35 hours or more. For the interpretation one should keep in mind that in our sample about 15% of women works 35 hours or more, which means that the marginal effect of young children is nevertheless relatively large. The marginal effect of young children for working one hour or more is similar or smaller than the marginal effect for working 12 hours or more, which implies that working up to 12 hours is a doable option for women with young children. Furthermore, the presence of more than one child in the household leads to a further reduction in the probability to work a certain number of hours. Educational attainment increases the probability to work full-time or at least in a large part-time job. For example, a tertiary level of education increases the probability to work full-time by 9 %-points, compared to a primary education (the reference group).

The unemployment rate is included in the regressions as a proxy variable for the period effect. The idea is that the macroeconomic circumstances affect the probability to be employed. The results are in line with the theoretical prediction as the impact of unemployment is significantly negative. The result implies that the favourable macroeconomic circumstances in the period from about 1996 to 2001 encouraged many women to work and also to work more hours.

Characteristics of the partner matter for the working hours of women. First, the presence of an unemployed partner increases the probability to be in a full-time or large part-time job. A higher level of education of the partner is associated with a higher number of working hours of a woman. However, taking into account interaction effects (presented in Appendix B) we find that for highly educated woman the propensity to work full-time or in a large part-time job is relatively high when the partner has a primary or upper secondary education. Apparently, highly educated women with less educated partners exploit their comparative advantage on the labour market by working more hours.

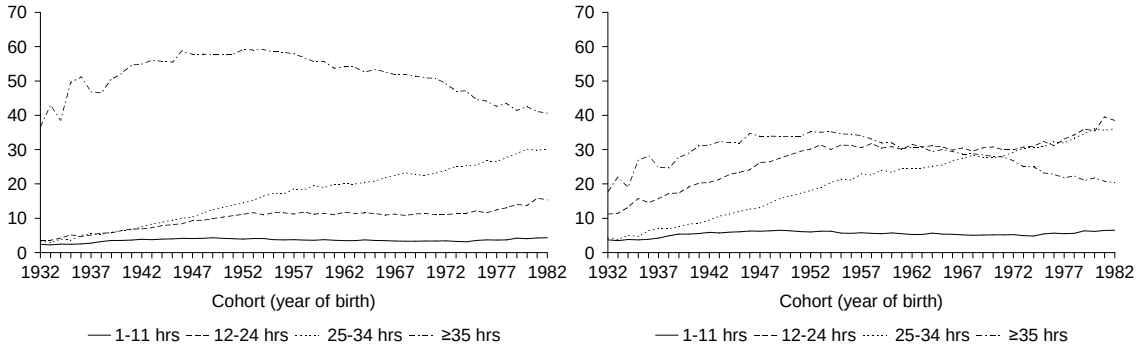
One of our main interests concerns the cohort effects on the propensity to work part-time or full-time (figure 4.1).[3] The cohort effects should be interpreted as unobserved cohort effects as observed variables like fertility and education will contain cohort effects as well. The results show a clear positive cohort effect for large part-time jobs (25-34 hours), while intermediate part-time jobs (12-24 hours) show an increasing cohort effect as well. The cohort effect for full-time employment increases until the generation born in the early 1950s, and decreases afterwards. Note that the figure concerns all women, hence the rise in female participation influences the outcome. A similar graph excluding non-working women (see Appendix C), however, shows that the main findings remain even if we confine ourselves to working women.

The probability of working full-time or part-time varies substantially with the individual and family characteristics. Women without children are likely to work full-time, and this holds in particular for single women without children (figure 4.2). Nevertheless, married women born after 1970 and without children have a large propensity to work part-time. Children have major implications for employment (figure 4.3). A vast majority of married mothers works 12-24 hours per week. Single mothers are less likely to be employed, but if employed they work relatively often full-time until the generation born in the early 1950s. Younger generations of single mothers are much more likely to work part-time.

[3] Marginal effects of age and cohort dummy variables are presented in table A.2 in the appendix.

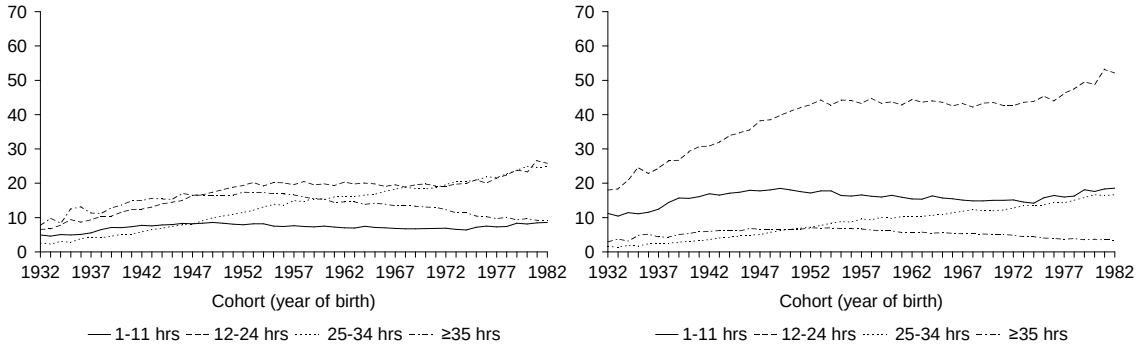
The probability to work full-time or part-time increases substantially by the level of education (table 4.2, upper panel). Note that the probability to work full-time is almost twice as high for women with tertiary education compared to women with primary education. The results also imply that the probability not to work decreases strongly with the level of education. The probability to work full-time decreases gradually when age increases from 30 to 50 (table 4.2, lower panel). The probability of working reaches a maximum at about age 40, while the probability to work part-time reaches a maximum at about age 50. After age 50 the probability to work part-time plummets

Figure 4.2 Probability to work part-time or full-time for single (left panel) and married (right panel) women without children by cohort, in percentage [a]



[a] The probabilities refer to two prototypes of woman with the following characteristics: age 40, upper secondary education, if married partner age 43, upper secondary education and employed, aggregate unemployment rate 4%

Figure 4.3 Probability to work part-time or full-time for single (left panel) and married (right panel) women with children by cohort, in percentage [a]

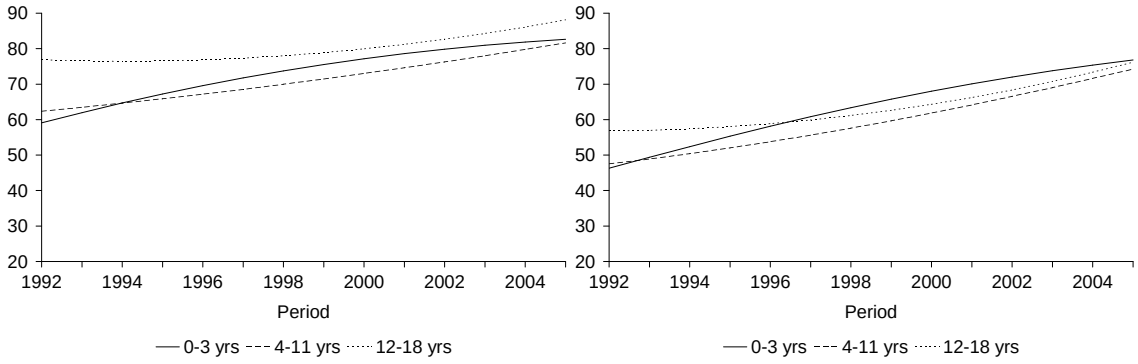


[a] The probabilities refer to two prototypes of woman with the following characteristics: age 40, upper secondary education, two children, age youngest child 4-11, if married partner age 43, upper secondary education and employed, aggregate unemployment rate 4%

We allowed the impact of children on working full-time or part-time to vary over time as tax and child care policy changes considerably during the last two decades (see section 2.1). Over

time having one child has become less of a hindrance to work at least 12 hours per week. The most pronounced increase is for mothers of children aged 0-3 years, with an increase of about 25 percentage-points (figure 4.4, left). For mothers of two children, the youngest child 0-3 years old, the growth in participation due to time-effects is about 30 percentage-points, which is even stronger (figure 4.4, right).

Figure 4.4 **Probability to work 12 hours or more per week for married women with one child (left panel) and two child (right panel), in percentage** [a]



[a] The probabilities refer to two prototypes of woman with the following characteristics: age 40, upper secondary education, partner age 43, upper secondary education and employed, aggregate unemployment rate 4% The probabilities vary over time due to interactions between time and the number of children.

Table 4.2 **Probability to work part-time or full-time, in percentages** [a]

	0 hrs	1-11 hrs	12-24 hrs	25-34 hrs	>=35 hrs	working hours
Level of education						
Primary	43.0	2.3	18.5	15.1	21.1	30.8
Lower secondary	17.5	4.2	27.4	20.9	30.0	30.6
Upper secondary	7.9	5.7	30.9	23.4	32.1	29.7
Tertiary	0.0	5.9	30.2	26.2	37.7	30.9
Age						
20	16.3	35.8	25.2	7.2	15.6	20.9
30	13.0	7.5	26.3	13.8	39.4	29.9
40	7.9	5.7	30.9	23.4	32.1	29.7
50	11.6	7.3	37.4	25.8	17.8	25.7
60	45.4	7.9	28.7	12.8	5.2	20.6

[a] The probabilities and working hours refer to a prototype of woman with the following characteristics: age 40 (upper panel), year of birth 1960, married, no children, upper secondary education (lower panel), partner age 43, partner upper secondary education, partner employed, aggregate unemployment rate 4%.

To explore the importance of the variables discussed before, like marital status, having children, education, age and cohort, we perform a decomposition of the aggregate growth in full-time and part-time employment and in working hours (table 4.3). The growth in participation rate is the

largest for working at least 1 or 12 hours per week, while the participation in full-time work actually decreased slightly.

The results of the decomposition suggest that presence of children and cohort effects are the two most important factors in explaining the positive growth in participation. Women with children have been participating more over time. The presence of a child in the household seems to have become less of a hindrance to participate than in the beginning of our sample period, as we saw already in figure 4.4. The cohort effects account for a large share of the aggregate growth in participation. Besides these two effects, education explains a substantial part of the growth as well. The negative age effects show a compositional effect of the various age profiles. Over our sample period the participation decreases because the share of older females increases. This compositional effect is in particular relevant for explaining the growth of large part-time and full-time jobs. Other effects like household position, education of the partner and unemployment played a minor role.

Table 4.3 Decomposition of growth in probability to work a certain number of hours (percentage-points) or working hours, women age 18-64, 1992-2005 [a]

Working hours	≥ 1 hour	≥ 12 hours	≥ 25 hours	≥ 35 hours	Working hrs.
Total growth 1992-2005	16.8	17.1	5.8	-0.7	– 1.3
Household position	0.3	0.5	0.6	0.3	0.0
Children	0.0	0.1	0.0	0.0	– 0.8
Children * household position	– 0.1	0.0	0.1	0.0	0.0
Children * period	5.8	7.4	2.5	1.4	1.1
Education woman	3.4	3.1	2.0	1.0	0.0
Education partner	0.4	0.4	0.2	0.1	0.0
Education women * education partner	– 0.2	0.5	0.4	0.1	0.4
Unemployment	0.2	0.4	0.3	0.2	0.0
Residual age effects	– 2.0	– 2.3	– 2.8	– 3.4	– 0.8
Residual cohort effects	8.9	7.1	2.4	– 0.5	– 1.1

[a] Second and higher order effects are spread out over all components according to the relative share of a component in total growth 1992-2005.

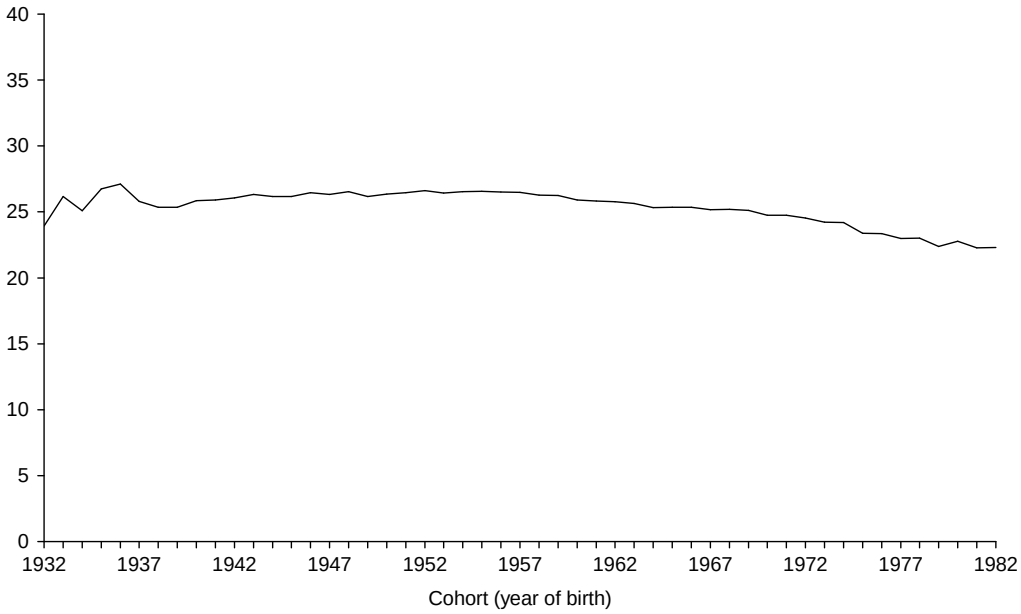
4.3 Working hours of employed women

In this section, we follow a different approach and focus on the working hours directly by means of an ordinary least squares regression. We confine ourselves to the subset of working women. The model features the same explanatory variables as the model of section 4.2. The last column of table 4.1 presents the results. The goal of the exercise is to see what happened to working hours over the successive cohorts, and to see whether the absence of a cohort effect in figure 3.3 still remains after a correction for observed individual and family characteristics.

As expected, the presence of children has a downward effect on working hours. This effect is stronger for young children and for a higher number of children. Over time, the downward effect of children on hours worked has diminished. Furthermore, partner characteristics play a role as well. Our findings show that highly educated women work more hours if they have a partner with a lower educational attainment.

The cohort effect is slightly decreasing for the cohorts born since the late 1950s, pointing at an autonomous trend for younger generations to reduce working hours (figure 4.5). The trend in working hours is consistent with the trends we found for separate hours classes in section 4.2. We concluded that small (1-11 hours) part-time jobs as well as full-time jobs show a decreasing autonomous trend, while there is an increasing trend to work in both large and medium sized part-time. Hence, for these younger cohorts both small part-time jobs and full-time jobs are gradually being replaced by substantial part-time jobs. The opposite movements in trends apparently cancels out, resulting in a rather stable trend in working hours worked for the pre-1960 cohorts and a slight decrease for the later generations.

Figure 4.5 Average working hours by cohort, working women age 18-64 [a]



[a] For all characteristics, the mean of the data are taken, except for the cohort dummies.

The impact of education on the working hours is small, and remarkably women with an upper secondary education have slightly lowered number of working hours (table 4.2). This seems to imply that educational attainment in particular affects to probability to be employed, and once employed working hours are rather constant over the different levels of education (keeping all other exogenous variables constant). The average number of working hours of working women

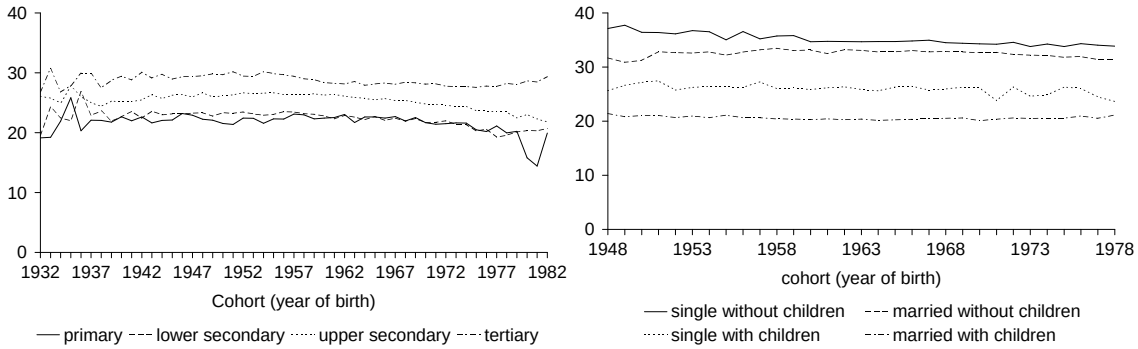
declined slightly over the time period 1992-2005. The diminishing negative impact of children should have led to slightly more working hours, but the negative age and cohort effect have been undoing this positive effect.

4.4 Sensitivity analysis

One of the basic assumptions underlying our analysis is that the cohort effects are separable from the other explanatory variables. If this assumption holds, we can interpret cohort effects as the underlying autonomous trend applicable to all women regardless of their individual characteristics. As a check on the appropriateness of this assumption we do some sensitivity analysis. We present the results for the ordinary least squares regressions for the working hours as they are easy to present.

The reduction in average working hours is present for both lower and upper secondary and tertiary educational levels, and is less convincingly (not significantly) present at the primary level of education. Graphically (see figure 4.6, left) the four lines run quite parallel to each other. This supports the assumption that the impact of cohort and education are separable. A similar check is done for subgroups classified by household type. We find that the underlying trend in working hours has been gradually decreasing for all working women and in particular for women without children. Working women with children show a slightly increasing trend in working hours. In a graphic presentation the lines are still fairly parallel to each other, supporting our assumption that the impact of cohort and household type are separable (figure 4.6, right).

Figure 4.6 Average working hours by cohort, working women [a]



[a] Each graph is based on four separate OLS regressions, estimated on subsets of the data by educational attainment (right panel) and by household situation (left panel). In the latter case the dataset is confined to women aged 25-45 as women older than 45 may have children that have left their parental home already.

Another implicit assumption is that the propensity to work does not depend on the immigrant status or cultural background of the women. We decided not to include such variables as they are not available for all years in the period 1992-2005. Nevertheless we did some sensitivity checks by including variables on immigrant background as explanatory variables and so deleting certain years from the sample. The results on the cohort effects remained unchanged. The cohort effect itself is may however be different for natives and immigrants. We will address this in future research.

5 Conclusions and discussion

In this study, we have investigated the development of the full-time and part-time employment over successive cohorts – or generations – of women aged 18 to 64, using data from the Dutch Labour Force Survey 1992-2005. Descriptive statistics show that the incidence of part-time jobs has increased over successive generations at the expense of full-time jobs and small jobs. As a result the average working hours of working women remained noticeably stable over the successive cohorts. This is in line with SCP/CBS (2006) and OSA (2007), who recently also concluded that the average working hours of working women do not show major changes over successive cohorts.

The stability of the average working hours of women is a striking fact if one considers the strong increase in the educational attainment of women. In order to gain insight in the underlying trends over cohorts, we carried out logistic regressions to estimate the probability to work full-time or part-time for women aged 18 to 64. The results show that a higher educational attainment is associated with a higher probability to work full-time or in a large part-time job. The presence of children significantly reduces the probability to work full-time, especially when children are young. The downward effect of children diminished however over time. We cannot draw strong conclusions on what has driven this development, but policy changes which took place during the 1990s – like the improvement in childcare facilities – are likely to have contributed to it. A decomposition shows that educational attainment and the diminishing effect of children explain more than half of the growth in working at least 12 or 25 hours per week.

The propensity of women to work part-time, conditional on the observed individual and family characteristics, has increased over the successive cohorts. A decomposition of this increase points out that the cohort effect explains almost half of the growth in working at least 12 or 25 hours per week. The cohort effect for the propensity to work full-time increased until the cohorts born in the early 1950s, while this propensity actually decreased for the younger generations.

The development of the propensity to work part-time or full-time should be interpreted with care as in particular unobserved time-trends may affect the results. An obvious concern is the real wage increase as it encourages women to participate on the labour market. We take this effect partly into account as we use the level of education as an explanatory variable. Nevertheless real wages increased for each level of education. So the real wage increase may be partly responsible for the steady increase in employment as employment became more attractive relative to non-employment. The decline in the propensity to work full-time for the younger generations, i.e. a negative substitution effect, is however more difficult to bring in line with the real wage increase. In case of a backward bending labour supply curve higher wages lead to a lower number of working hours. A recent literature study (Evers *et al.*, 2007) finds however evidence that the wage elasticity for Dutch women is positive and around 0.5. Furthermore, our sensitivity analysis shows that the propensity to work full-time was stable for highly educated women. It seems therefore unlikely that wages are so high that many women are on the backward bending part of their labour supply curve. A last concern is that the real wage increase may have an income effect through the earnings of the partners as well. This will be left open for possible future research.

The result on the propensity to work full-time is consistent with studies on stated preferences and attitudes towards the employment of women. The SCP (2006) finds that among women who work part-time and do have a working male partner, 96% prefers to work part-time. The number of individuals with a negative attitude towards women combining work and raising children decreased strongly until the generation born in the early 1950s, while from that generation onwards the attitude stayed stable (SCP/CBS, 2007). And even stronger, there is evidence that the younger generations are slightly more conservative than the generation of the 1950s. This is consistent with our particular result on the cohort effect of working full-time. Furthermore, the generation born after 1950 also benefited from the contraceptive pill becoming available, which had an important upward effect on the investment in education by women and the age at which women married in the US (Goldin and Katz, 2002).

Taking the evidence together, the results imply that – unless effective policy measures are implemented or a substantial shift in social norms takes place – full-time work is not expected to become the standard model for Dutch women in the near future. As older generations on the labour market will be replaced by younger generations featuring a low propensity to work full-time, the average female working hours is not expected to increase in the near future.

This study is about the balance between work and family life, and the Dutch part-time model seems an interesting solution to maintain a balance. The study emphasizes the development of working of women over successive cohort, and so ignores many interesting other issues. First, if

the balance between work and family life is hard to achieve women may decide to have no or fewer children. So fertility is an endogenous decision that may be investigated as well. Second, in most households there is a husband present and he may contribute to the balance as well. So future research may address the labour supply behaviour of both the husband and the wife, additionally including a possible income effect through the wages of the husband as well. Third, one ultimate interest is in how policies affect the balance between work and family life and how they affect labour supply and fertility decisions. Future research may address more explicitly the causal impact of policy.

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Appendix A: Summary statistics by working hours

Table A.1 Summary statistics, women age 18-64, in years or percentages

Working hours	0	1-11	12-24	25-34	35+	All hours
Age	46.2	37.0	39.7	37.5	33.8	40.7
Cohort (year of birth)	1952	1962	1960	1962	1965	1958
Household position						
Married	67.0	63.6	74.5	50.6	31.5	59.3
Cohabiting, been married	1.7	1.1	2.1	2.8	2.5	2.0
Cohabiting, never been married	3.8	5.0	8.5	19.3	25.6	10.8
Single, been married	14.0	4.8	6.0	8.5	7.3	9.7
Single, never been married	6.6	8.4	4.2	11.1	19.5	9.3
Living with parents	5.6	15.8	4.0	6.7	11.8	7.5
Other	1.3	1.4	0.7	1.0	1.7	1.2
Children						
Age youngest child 0-3	13.0	13.9	22.3	11.1	4.7	13.0
Age youngest child 4-11	13.3	20.6	22.2	12.5	5.5	14.0
Age youngest child 12-17	7.9	11.0	13.6	10.4	5.6	9.1
Two minor children	14.3	22.1	27.4	13.7	5.6	15.7
Three or more major children	7.7	10.1	8.6	4.2	2.0	6.6
Major children	16.5	16.1	16.6	12.7	7.7	14.3
Education attainment						
Primary	23.3	10.0	7.1	5.2	4.8	13.3
Lower secondary	34.2	31.6	23.2	18.2	16.1	26.5
Higher secondary	31.7	44.6	47.1	44.2	45.1	39.8
Tertiary	10.8	13.7	22.5	32.4	34.0	20.3
Type of education						
General	44.3	38.5	25.6	19.9	20.8	32.8
Technical	6.2	5.2	4.9	5.9	7.9	6.2
Economic	12.3	12.3	17.7	18.9	29.8	17.5
Health	37.3	44.0	51.7	55.3	41.5	43.5
Partner characteristics						
Age	50.2	44.3	43.0	40.8	37.3	44.9
Primary	16.4	10.2	6.9	6.2	6.4	10.9
Lower secondary	23.1	23.3	18.6	17.1	17.2	20.5
Higher secondary	39.2	43.9	44.4	42.8	44.3	42.0
Tertiary	21.2	22.6	30.1	34.0	32.1	26.6
Unemployed	1.8	1.0	1.2	1.4	1.5	1.5
Number of observations	212590	49200	104299	59365	89532	514986

Appendix B: Extended estimation results

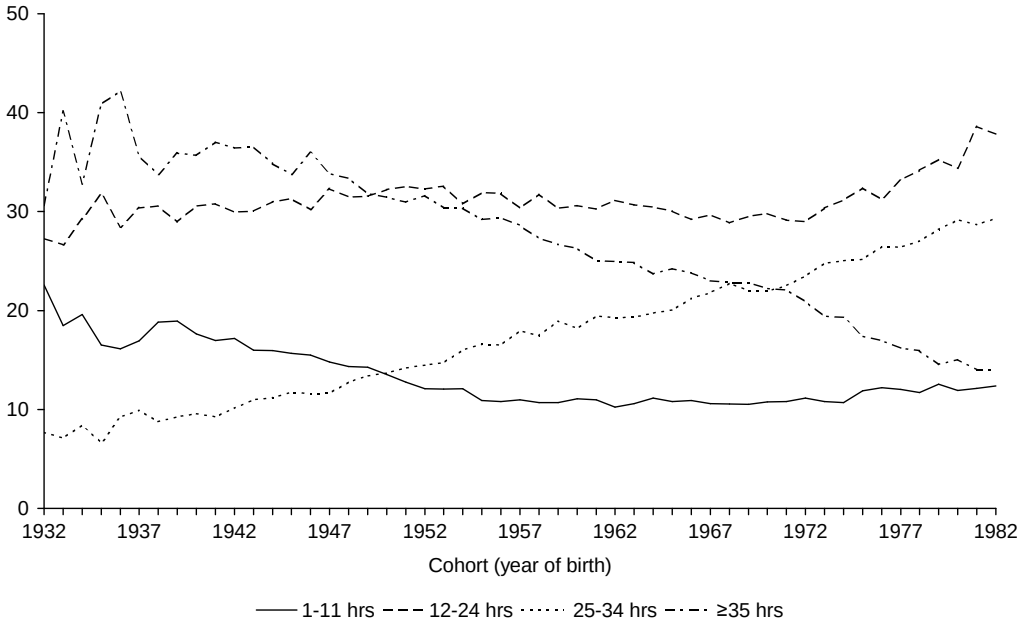
Table B.1 **Extended estimation results for table 4.1, marginal effects for probability to work at least a certain number hours (in percentage-points) or working hours, women age 18-64**

	≥1 hours		≥12 hours		≥25 hours		≥35 hours		Working hrs.	
	Marg. Effect	Std. Err	Marg. Effect	Std. Err	Marg. Effect	Std. Err	Marg. Effect	Std. Err	Marg. Effect	Std. Err
Time and children [a]										
T and age youngest child 0-3	2.0	0.2	2.3	0.2	0.4	0.2	0.2	0.2	0.1	0.1
T^2 and age youngest child 0-3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
T and age youngest child 4-11	0.4	0.3	0.4	0.3	0.3	0.2	0.3	0.2	0.1	0.1
T^2 and age youngest child 4-11	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
T and age youngest child 12-17	– 0.5	0.2	– 0.7	0.2	0.1	0.2	0.5	0.1	0.2	0.1
T^2 and age youngest child 12-17	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
T and two minor children	0.4	0.3	0.4	0.3	0.5	0.2	0.0	0.2	0.1	0.1
T^2 and two minor children	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
T and three or more minor children	0.2	0.3	0.8	0.3	0.3	0.3	0.2	0.2	0.1	0.1
T^2 and three or more minor children	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time and single [a]										
Single and age youngest child 0-3	– 15.9	1.0	– 10.0	1.0	3.6	0.9	– 0.3	0.6	2.4	0.3
Single and age youngest child 4-11	– 8.3	0.9	– 3.8	0.8	2.2	0.7	– 1.6	0.4	0.7	0.2
Single and age youngest child 12-17	– 3.4	0.8	– 0.5	0.8	3.4	0.7	0.1	0.4	1.2	0.2
Single and two minor children	5.6	0.8	8.1	0.9	5.4	0.8	2.4	0.6	0.6	0.2
Single and three or more minor chld	7.2	1.2	10.5	1.3	3.2	1.1	1.9	0.9	0.9	0.4
Education woman-partner										
Lower-primary	– 8.0	0.9	– 9.4	0.9	– 7.2	0.6	– 3.4	0.4	– 1.0	0.3
Lower-lower	– 11.6	0.8	– 11.3	0.8	– 6.3	0.6	– 3.1	0.4	0.2	0.3
Lower-upper	– 11.4	0.8	– 11.1	0.8	– 6.9	0.6	– 3.6	0.4	– 0.3	0.5
Lower-tertiary	– 9.8	1.4	– 8.8	1.4	– 6.6	1.1	– 4.6	0.6	– 0.4	0.3
Upper-primary	– 5.8	1.0	– 1.3	1.0	– 1.1	0.8	– 0.8	0.5	2.6	0.3
Upper-lower	– 9.4	0.8	– 4.2	0.9	– 2.8	0.7	– 1.6	0.4	2.9	0.3
Upper-upper	– 9.2	0.8	– 5.1	0.8	– 4.3	0.6	– 2.3	0.4	2.2	0.3
Upper-tertiary	– 10.3	1.3	– 5.9	1.4	– 5.5	1.1	– 4.3	0.6	1.5	0.2
Tertiary-primary	– 6.5	2.2	3.2	2.1	8.0	1.8	5.1	1.3	5.7	0.2
Tertiary-lower	– 4.5	1.3	5.7	1.3	7.7	1.1	4.5	0.8	5.7	0.5
Tertiary-upper	– 6.1	0.9	1.4	1.0	2.6	0.8	1.1	0.5	4.1	0.5
Tertiary-primary	– 3.9	1.4	3.8	1.5	4.7	1.5	– 0.1	0.9	4.2	0.5

[a] Time T is defined as year minus 1992.

Appendix C: Simulation results for working women

Figure C.1 **Average probability to work part-time or full-time by cohort, working women age 18-64, in percentages** [a]



[a] For all characteristics the mean of the data are taken, except for the cohort dummies.