Maternity and working life: reconsidering the effectiveness of part-time employment

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Very preliminar

Abstract

The way in which professional and familiar life are reconciled might have important economic consequences both at individual and aggregate level. While as a flexible employment opportunity, part-time work might serve to reconcile work and family life, and to increase female participation in the labour market, it might also give rise to new forms of inequality, thereby undermining the equal opportunities objectives established by the EU social policy. Creating substantive equality between part and full-time workers, and achieving gender neutrality, means ensuring those workers who combine part-time work with child care responsibilities do not suffer detrimental consequences in their career prospects.

Although several actions at the European Community level have been undertaken in order to achieve this equality between part and full-timers, yet there is evidence of a clear relation between atypical work, forms of parental leave, and

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gender discrimination in the labour relations of Members States. In this line, many works have revealed that part-timers are very often at a disadvantage compared to their full-time counterparts, both in terms of hourly wages and transition probabilities into unemployment. In the way that part-timers experience higher probabilities of exiting the labour market, it would make this form of employment less attractive for women with child care responsibilities. This would explain why in some countries full-time employment is the preferred option for mothers who wants to remain in the labour market.

1.-Introduction

The manner in which professional and familiar life are reconciled has important economic consequences at different levels. On the one hand, from an individual point of view, jobs with rigid working hours can make maternity as the counterpart of a career path. On the other hand, the existence of restrictions to conciliate personal and professional life appears to have significant effects in variables like the rates of fertility (which causes negative effect on the population structure of ages and onto long-term labor supply, questioning the viability of the pensions system, ...), rates of activity, productivity, human

capital (when people abandon the labor market to have a children coincides with the stage of high relative productivity), etc.

Furthermore, when childcare activities are unequally distributed among genders, discrimination can also emerge, both in terms of wages and employment probabilities. As pointed out by Gunderson (1989), the different responsibilities of males and females towards childcare activities might lead to wage discrimination between genders. The traditional rol of women as the main, and usually unique, responsable of child care activities affects female earnings through different ways: employment choice restricted to home proximity, work absenteeism, career and formation interruptions, rejection of work promotions, etc. Under this view, maternity decision has costs in terms of human capital accumulation, particularly if females abandon the labour market either temporarily or permanently. Walfogel (1997) points out that the "wage gap" between women with and without children can be partially explained by human capital argument. Since women with children spend more time out of the labor market, their labour market experience declines, and as a consequence their level of human capital accumulation.

One of the most widely used instruments to conciliate professional and familiar life is the part-time employment. As Del Boca (2002) points out, the lower levels of part-time employment observed in Italy and Spain are associated with

low employment rates of married women, particularly those with children. This would suggest that, in these countries, remaining in full-time employment or exiting the labour market is the most common choice among females with childcare responsibilities. Unfortunately, a large share of women tends to choose the later.

One of the main advantages of part-time employment is that it may offer a better balance between working life and family responsabilities. However, as suggested by many studies (Ermisch and Wright, 1993; Waldfoel, 1997; Dekker et al., 2000), part-time workers are very often at a disadvantage compared to their full-time counterparts. Typically, their hourly wages are lower, they are less well-protected, they receive fewer fringe benefits and their career prospects are more limited. Different arguments have been used to explain such differences between part and full-timers. For instance, Montgomery (1988) argues that recruiting and training costs discourage firms from hiring part-time workers. Ermisch and Wright (1993) point out that the use of part-time work as a form of parental leave implies that women will be segregated on the labour market. As a consequence, the bargaining power of female employees concerning aspects like wages will be decreased. The reason is that, for women with child care responsibilities, the possibility of reducing the number of working hours is

more valuable than earning higher hourly wages.[2]. Finally, another explanation to wage differentials rely on human capital accumulation, since actual and past episodes of part-time employment might lead to lower rates of accumulation of human capital thus reducing wage earnings.

All the abovementioned arguments used to explain wage differentials are also valid to explain differences in the transition rates into unemployment between part and full-timers. For instance, higher recruiting and training costs lower the availability of part time positions. Indeed, wage reduction increases the likelihood of job offer rejection[3]. Both arguments leads to the same conclusion: transition rates into unemployment are found to be more likely among part-time workers.

Differences in the transition probabilities out of employment between part and full-timers, and the subsequent persistence of unemployment episodes are important issues when analyzing the effects of maternity on female career's prospects. The presence of a newborn child makes females to decide whether continuing at work or abandoning the labour market. When the former decision is taken, they should then choose the desired number of working hours, mainly, females would decide whether working part- or full-time. All these decisions can

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[2] Part-time jobs are more frequent in the services sector, where wages tend to be lower than the observed in the industry sector.

[3] In other terms, increases the probability that the wage rate of job offer would be lower than the reservation wage.

be of paramount importance for females' future career path, and can be significantly affected by labour market conditions. In an environment where transition probabilities out of employment are significantly higher for part-timers compared to full-timers, part-time employment would be less attractive for those females with childcare responsibilities who desire to remain in the labour market. In such a case, the efectiveness of part-time employment as a way to conciliate professional and family life would be subject to debate. This paper is intended to examine this issue and, in particular, to study how maternity affect the career prospects of female workers.

The paper is organized as follows. In the next section we provide an overview of the recent trends in part-time employment and its gender component. In Section 3 we present the main features of an inter temporal model of fertility with endogenous selection of working hours in the presence of differences in transition probabilities into unemployment. Section 4 show some interesting results obtained from model simulation. In Section 5 we provide some empirical evidence for two countries (Spain and the Netherlands) with interesting differences in the incidence of part-time employment and in the effect of maternity on females' career path. Finally, Section 6 concludes.

2.- Recent trends in part-time employment and the gender component

The last 25 years have seen part-time work in the OECD undergo rapid growth (O'Reilly & Fagan, 1998) and become a prominent feature of labour markets. The upward trend in part-time employment has been constant in recent years. However, part-time work is not equally distributed across gender and age groups, nor across countries, sectors or occupations. A cross-country analysis shows that part-time work is more widespread in northern European countries. Of these, the Netherlands has the highest percentage of part-time workers, namely 34.8 per cent and 43.8 per cent of total employment in 1992 and 2002, respectively. In contrast, the lowest percentage of part-time employment can be found in southern European countries. For example, in Spain in 1992 and 2003, part-time work represented only 6 per cent and 8 per cent of total employment, respectively.[4] Furthermore, part-time employment is mainly female employment. In 2003, female part-time employment in the Netherlands was almost 75 per cent of total employment. Also in Southern European countries, part-time employment is mainly female work. In 2004 Spanish female workers represented 81.4 per cent of the total part-time labour market, according to the periodical publication of the Women's Institute, *Mujeres en Cifras*.[5]

One of the reasons for these gender differences in both countries is the lack of sufficient care services provide by the public sector, which hinders the conciliation of family and working life (Plantenga, 1999). This shortage of care

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[4] *Part-time Work in Europe*. European Foundation for the Improvement of Living and Working Condtions, 2005.
[5] Source: National Employment Institute (EPA, 2004)

facilities makes part-time work the most suitable option for women with young children and women who are in charge of dependants and are entering or re-entering the labour market (Visser et al., 2004). [6] In the Netherlands, many working mothers exhibit a preference for part-time work as a good way to combine paid work and motherhood. This trend has led to the normalization of part-time work in the Netherlands (Visser & Yerkes, 2005).

Women's preference for part-time work as a form of parental leave explains the impact of maternity and paternity on the working-time patterns of male and female workers. [7] In all EU-15 countries, it can be observed that when men have dependants, their working hours tend to increase, while the opposite effect can be detected amongst female workers. [8] Women tend to work on a full-time basis at the beginning of their careers, but when they give birth a high number of them abandon paid work or reduce their working hours (Wetzels, 1999). In all EU-15 countries, the female component of the couple has the main responsibility for domestic and care duties. [9]

Several EU Member States have used public policies and subsidies to promote the use of part-time work for female workers as a sort of parental leave, or as a

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[6] *EUROSTAT, News Release 49/2005, 12 April 2005.*

[7] See EC, *Gender Use of Time: Three European Studies,* Office for Official Publications of the European Communities, Luxembourg, 2000 and EC, *Women at Work,* Office for Official Publications of the European Communities, Luxembourg, 1999.

[8] EUROSTAT (ALIAGA, C.), *«Gender gaps in the reconciliation between work and family life», Statistic in focus, Population and social conditions,* 4/2005.

[9] European Foundation for the Improvement of Living and Working Conditions, (Burchell, B.), *Gender, Jobs and Working Conditions in the EU,* 2002.

way to conciliate family and work (Tobler, 1999). In this context, 'part time' becomes a demographic instrument used to combat the decreasing tendency of fertility rates (Valdés Dal-Ré, 2000). The Netherlands is a paradigmatic example of the use of part-time work as tool to allow the conciliation of personal and working life. This kind of legislative policy leads to questions concerning the extent to which flexible employment possibilities might serve to reconcile working and family life. In that sense, these possibilities are a potential solution for high levels of female unemployment, they might contribute to the achievement of higher levels of social and economic cohesion, and they might foster the equality of opportunities. In contrast, some flexible work arrangements might have a negative impact on the working conditions of certain groups of marginal workers. Notably, while the use of part-time work as a form of parental leave remains a female pattern, women will be segregated on the labour market. Thus, this part-time female employment pattern might give rise to new forms of gender discrimination and thus be detrimental to the quality and the stability of female work. This is because working part time often hinders the development of women's careers and decreases their ability to compete in the labour market on an equal footing with men.

The "principle of proportionality" is the tool used by the Community legislation to achieve equality between part-time and full-time workers. Directive 97/81/EC has been intended to protect part-time workers from discrimination

in employment and occupation. The aim is to provide part-timers with the same salary and working conditions as full-timers. However, the Directive merely recommends Member States to promote this kind of employment contract as a formula to conciliate working and family life, thus connecting this Community legal instrument with the one that deals with parental leave [10] (Cabeza Pereiro, 2000). In this sense, the Framework Agreement on part-time work indicates the need to promote part-time work and transfers from part-time to full-time jobs (and vice versa). The purpose is to encourage employers to 'as far as possible' facilitate those transfers and establish an information procedure in relation to vacancies in the undertaking or establishment. Nevertheless, the Directive does not impose an obligation to act in this way, but merely recommends Member States to follow that path. Notwithstanding the objectivity and rationality of the abovementioned principle, the strict applicability of this criterion might result in the perpetuation of indirect gender discrimination. Therefore, as long as part-time remains predominantly a female choice and subjected to strict proportionality rules, the configuration of part-time work will be tainted with precariousness (Gónzalez Pérez & Rodríquez-Piñero Royo, 1998) and will reflect, in general terms, a depreciation of the value of women's work performance (Borrajo Dacruz, 1978).

3.- Model

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[10] Council Directive 96/34/EC of 3 June 1996 *on the framework agreement on parental leave* concluded by UNICE, CEEP and the ETUC. OJ L 145, 19.06.1996.

Maternity decision

The presence of children in the household has been generally viewed as one of the most important determinants of female labour supply. Since the pioneering work of Heckman (1974) many studies have pointed out (see Cleveland et al., 1996 for a list of examples) that the presence of children, particularly children under six years of age, tend to increase the probability of both abandoning the labour market and reducing the number of working hours. Conversely, the increase in female participation in modern economies has lead to a decline in fertility rates. Thus, it appears that labour supply and maternity are inherently interrelated decisions. Many works have provided empirical evidence of this fact. For instance, Blau and Robins (1989), point out that women with high levels of human capital bunch their births in order to minimize the amount of time they spent out of labour market.

In this paper we present a model where the decision of having a child is added, as a separable term (B), into the welfare function of the representative household.[11] If the agent decides to have a baby her welfare increases in B, but in turn she must afford a minimum level of « child care », $y_t \geq y_t^*$. This "child care" good can be produced internally or bought in the market at a price p. B can be thought as the utility level reached by the child when he/she

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[11] For the sake of simplicity, we assume that the direct utility given by the decision of having a child is exogenous and fixed, but it can be random or deterministic or can depend on variables like age, labour stability, household dwelling tenure, etc.

consumes y_t^*, being y_t^* the level of consumption that maximizes child utility, which is exogenously given[12].

As pointed out by many papers (Cleveland et al . (1996);, Blau and Robins (1989); Blau and Robins (1991); Lehrer and Kawasaki (19859)), child care is of paramount importance because its costs, availability, and quantity or quality desired, are readily reflected in fertility rates, female labour supply and the decisions of abandoning the labour market and, eventually, re-entrying. In this sense, some works have argued that higher wage rates and reduced child care costs are associated with both higher labour supply and child care demand. Del Boca (2002) finds that the response of labour supply to changes in child care costs is work time dependent. A reduction in child care costs only increases the probability of working part-time among females, while it has no effect on the probability of working full time. Following the empirical evidence (Ribar, 1995), child care expenditures, py_t^*, are assumed to be fixed with respect to hours worked.

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[12] Under this view, and assuming separability in the parents utility function, the female welfare can be re expressed as:

$$U(c,l,I_b U^c(y^*)) = U(c,l) + I_b U\left[U^c(y^*)\right] = U(c,l) + I_b B$$

where I_b is a variable that takes value 1 when the couple decides to have a child, and 0 otherwise.
This formulation is very similar to Hamilton "extended fitness" coming from Biology (see Bergstrom,1996)
For simulation purposes, utility function is given by $U(c,l) = log(c) + \alpha \, log(l)$.

The threshold value y_t* reflects the minimum level of consumption good that must be achieved in order to guarantee an acceptable level of "childcare". This minimum level can be thought of as a function that depends on several variables, such as child number, child age (for instance, new-borns need more intensive care), socioeconomic status, etc. Imposing that the amount of child care must be at least that minimum level may lead to changes in optimal allocations depending on whether such minimum acts as an active or binding constraint. As pointed out by several studies, the level of childcare decreases with the age of the child (See table 2 for the case of Spain). Thus, we introduce this feature in our model by imposing the condition $y_\tau* > y_{\tau+1}*$, being τ any period of time after the decision of having a child has been made. For model simulation purposes we assume that childcare needs decrease exponentially with time. [13]

Table 2.- Weekly hours devoted to childcare			
	Child under 2 years	Child between 3 and 5 years	Child between 6 and 9 years
Total time (hours: minutes)	30:00	15:09	15:35
Avaliabability of domestic service			
With domestic service	36:45	16:48	16:34
Without domestic service	27:27	14:24	15:10
Income (monthly)			

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[13] Given the scarcity of data, any other decreasing function can be also considered.

Less than 1,000 €	22:22	13:38	18:17
1,000- 1,499 €	24:46	13:17	14:24
1,500-1,999 €	28:18	14:58	17:00
2,000 and more	35:18	16:45	14:37

Source: Spanish National Institute. Survey on Use of Time 2002-2003

Childcare can be bought, either by hiring domestic service personnel or by taking children to kindergarten, or it can be internally produced. Assuming that agents have a total amount of time normalized to one, devoting $0 < h < 1$ units of time to home production would produce $F(h)$ units of childcare good. The home production function, $F(h)$, will be such that $F(h_{max}) > y_1{}^*$, so that there exists the possibility that childcare could be entirely covered by home production. [14] In addition, we impose a "non market" constraint in household production, so that any excess of home production can not be sold to the market. This would imply that $F(h) \leq y_t{}^*$, reflecting the fact that women who quit the labour market to take care of their children usually do not care other's children, and do not open their own kindergarten.

Labour market

The existence of labour market rigidities restrict the type of employment arrangements. In our model, institutional rigidities existing in the labor market affect both job duration and working hours. First, we assume that all jobs last

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[14] In the simulations the home production function we consider have constant productivity $y = F(h) = Ah$.

only one period. And second, the probability of receiving a job offer next period depends on the type of employment arrangement observed in previous period.

We consider that the agent can choose between three possible labour states: i) full-time employment, which excludes the possibility of home production, ii) part-time employment, together with home production, and iii) unemployment, devoting all the non leisure time to home production. [15] Transition probabilities between the three labour market states are clearly affected by a problem of initial conditions. This implies that the original labour market state would also affect transition rates between two consecutive periods. This is in line with some other works in the literature (Blanchard and Diamond, 1994; Shimer, 2005)[16] showing that workers initially in full-time employment are more likely to remain employed next period, while part-time employment tends to increase the likelihood of moving out of employment. In order to incorporate this assumption into our model, we consider that $p_{FT} \geq p_{PT} \geq p_{NJ}$, being p_j *(j=Full time (FT), partial time (PT) , no job (NJ)* the probability of receiving a job offer next period conditional on the initial labour market state. After receiving a job offer, the agent must decide whether reject or accept it. In the first case the agent would be voluntary unemployed next period, while in the later case he/she has also to decide the amount of working hours. Finally, with probability (1- p_j)

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[15] In principle we do not distinguish between voluntary and involuntary unemployment.

[16] Other studies focus on the wage differences between full time positions and partial time positions. Including this feature in the model has not special difficulties but we prefer ignore it, focusing our theoretical analysis only in differences in transition probabilities to unemployment linked with the election of time of job.

the agent does not receive any job offer, so the only option for next period is involuntary unemployment.

Time allocation alternatives

Since the amount of total disposable time is finite and normalized to unity, the choice of working hours and hours devoted to home production are clearly related by the constraint, *1 = z+h+l*, being, *z* the working time, *h*, time devoted to home production and *l*, leisure time. For the sake of simplicity, we consider only a finite number of feasible combinations between the time devoted to these non leisure activities (see Table 3), imposing a minimum level of leisure equal to 0.2 time units.

Table 3.- Feasible Time allocation			
Children in the household			
	Household production time[17] (h)		
Working hours(z)	0	$h^{PT} = 0.4$	$h^{F} = 0.8$
0			No employment
$z^{PT} = 0.4$		Part-time	
$z^{FT} = 0.8$	Full-time		

[17] Given the constraint $F(h) \le y_t{}^*$, any excess of time devoted to home production is treated as more leisure time.

No children in the household

Job time	Household production time		
	0	0.4	0.8
0	No employment		
z^{PT} =0.4	Part-time		
z^{FT} =0.8	Full-time		

Fig.1 Timeline of decisions
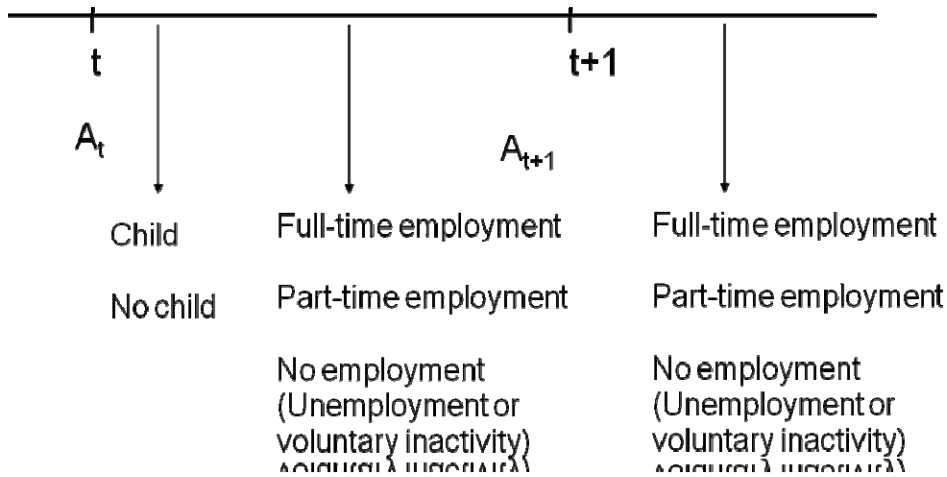
Bellman equations

In terms of Bellman equation there are three states variables: "*wealth*", A, "*type of employment*" (full-time, part-time, non-employment) and "child". We assume that wealth is the only continuous state variable. Following the abovementioned arguments, we denote p_{FT}, p_{PT} and p_{NJ} as the next period

employment probabilities if the agent is respectively in full-, part-time or non-employment at current period.

We can write the Bellman equations for every state, and the correspondent resource constraint (in addition with the "non market" constraint $F(h_t) \leq y_t *$) as follows:

- "Child" and "full-time employment"

$$V_t^{C,FT}(A_t) = \max\{U(c_t, 1 - z^{FT}) + B + \beta p_{FT} V_{t+1}^{C,TJ*}(A_{t+1}) + \beta(1 - p_{FT}) V_{t+1}^{C,NJ}(A_{t+1})\}$$

s.t.

$$c_t + A_{t+1} = z^{FT} w_t + (1 + r) A_t - p y_c ;$$

- "Child" and "part-time employment"

$$V_t^{C,PT}(A_t) = \max\{U(c_t, 1 - h^{PT} - z^{PT}) + B + \beta p_{PT} V_{t+1}^{C,TJ*}(A_{t+1}) + \beta(1 - p_{PT}) V_{t+1}^{C,NJ}(A_{t+1})\}$$

s.t.

$$c_t + A_{t+1} = z^{PT} w_t + (1 + r) A_t - p y_c - p * F(h^{Tp}) ;$$

- "Child" and "non-employment"

$$V_t^{C,NJ}(A_t) = \max\{U(c_t, 1 - h^F) + B + \beta p_{NJ} V_{t+1}^{C,TJ*}(A_{t+1}) + \beta(1 - p_{NJ}) V_{t+1}^{C,NJ}(A_{t+1})\}$$

s.t.

$$c_t + A_{t+1} = (1 + r) A_t - p y_c - p * F(h^F) ;$$

- "No child" and "full-time employment"

$$V_t^{NC,FT}(A_t) = \max\left\{ \begin{array}{l} U(c_t, 1 - z^{FT}) + \beta p_{FT} \max\{V_{t+1}^{C,TJ*}(A_{t+1}), V_{t+1}^{NC,TJ*}(A_{t+1})\} + \\ + \beta(1 - p_{FT}) \max\{V_{t+1}^{C,NJ}(A_{t+1}), V_{t+1}^{NC,NJ}(A_{t+1})\} \end{array} \right\}$$

s.t.

$$c_t + A_{t+1} = z^{FT} w_t + (1+r)A_t \, ;$$

- ▪ "No child" and "part-time employment"

$$V_t^{NC,PT}(A_t) = \max \left\{ \begin{array}{l} U(c_t, 1-z^{PT}) + \beta p_{PT} \max\left\{ V_{t+1}^{C,TJ*}(A_{t+1}), V_{t+1}^{NC,TJ*}(A_{t+1}) \right\} + \\ + \beta(1-p_{PT}) \max\left\{ V_{t+1}^{C,NJ}(A_{t+1}), V_{t+1}^{NC,NJ}(A_{t+1}) \right\} \end{array} \right\}$$

s.t.

$$c_t + A_{t+1} = z^{PT} w_t + (1+r)A_t$$

- ▪ "No child" and "non-employment"

$$V_t^{NC,NJ}(A_t) = \max \left\{ \begin{array}{l} U(c_t, 1) + \beta p_{NJ} \max\left\{ V_{t+1}^{C,TJ*}(A_{t+1}), V_{t+1}^{NC,TJ*}(A_{t+1}) \right\} + \\ + \beta(1-p_{NJ}) \max\left\{ V_{t+1}^{C,NJ}(A_{t+1}), V_{t+1}^{NC,NJ}(A_{t+1}) \right\} \end{array} \right\}$$

s.t.

$$c_t + A_{t+1} = (1+r)A_t$$

where,

$V^{C,FT}(A_t)$, value function for "child and full-time employment " states;

$V^{C,PT}(A_t)$, value function for "child and part-time employment" states;

$V^{C,NJ}(A_t)$, value function for "child and non-employment" states;

$V^{NC,FT}(A_t)$, value function for "no child and full-time employment" states;

$V^{NC,PT}(A_t)$, value function for "no child and part-time employment" states;

$V^{NC,NJ}(A_t)$, value function for "no child and non-employment" states;

being,

$$V^C(A_t, TJ*) = \max\left\{ V^{C,FT}(A_t), V^{C,PT}(A_t), V^{C,NJ}(A_t) \right\};$$

and,

$$V^{NC}(A_t, TJ**) = \max\left\{ V^{NC,FT}(A_t), V^{NC,PT}(A_t), V^{NC,NJ}(A_t) \right\};$$

As it can be seen, the model presented in this paper belongs to the general class of "optimal stopping" models. The decision of having a child is optimal whenever $V^C(A_t, TJ^*) > V^{NC}(A_t, TJ^{**})$, being TJ^* the optimal time of job given child or no child decision (TJ^* given child could be different from TJ^{**} given no child decision).

4.- Simulations results

Numerical simulations of the model are done by assuming that the agent has not children at time $t=0$ and she must decide whether to have a child or not, considering a temporal horizon of $T=50$ periods (these timeline decisions were represented in Figure 1). Maternity decision implies to consider the optimal path of working hours subject to child care needs, unemployment transition probabilities and initial wealth. The values of parameters[18] used in the simulations are calibrated in order to make working full time the preferred option when household is in "no child state", and female are not retired. The retirement is modeled imposing exogenously an hourly wage equal to zeroafter t =40.

In our model precautionary saving motives can be due to either unemployment risk or compulsory retirement. For the sake of model realism, retirement is

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[18] More details are given in table 4.

implicitly modelled by assuming that the wage rate evolves coherently with the life-cycle hypothesis[19] (see Figure 2). Since our objective is to analyze the transition probabilities into unemployment, we assume that the choice of working hours does not affect the wage rate, although the model could be easily modified to include this feature.

Figure 2.- Wage time profile used in the simulations.
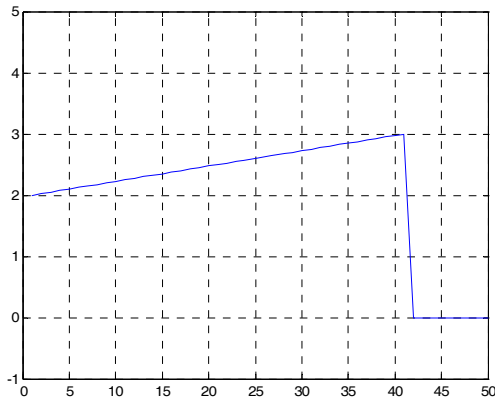
In the "child" state, given the value of wage and child care cost used in the simulation, home production of child care services is the optimal decision in early stage of maternity, when child care needs are more intense. Since these needs are decreasing with time, the abandoning of labor market is only temporary, and the agent will subsequently return to full activity, buying the child care services in the market if needed.

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[19] With a wage rate constant and equal for all the simulation period, the basic labor supply response to differences in probabilities of transition to unemployment do not experiences significant changes.

Table 4.   . Simulation details.

"Utility function" $U(c,l) = \log(c) + \alpha \log(l)$, with $\alpha=.1$

"Child utility", B=1

"Child care price," p=1

"Child care minimum level", $y_t* = 1 + 2e^{-0.1t}$

"Home production function", $y = \dfrac{3}{0.8}h$

"Discount factor " $\beta = 1/(1 + r)$; *r=0.05*

"Asset"   A=[0, 50]

"Hourly Wages", $w = \begin{cases} 2 + (1/40)t & 0 < t \leq 40 \\ 0 & t > 40 \end{cases}$

In order to disentangle the effect of differences in unemployment risk, we simulate two scenarios which differ only in the unemployment transition probabilities. In the first scenario, we assume equal probabilities of transition to unemployment irrespective of previous labor state (full time, part time or unemployment). In the second case, we assume that unemployment transition probability varies inversely with work time, in other terms, we assume that $p_{FT} \geq p_{PT} \geq p_{NJ}$.

Focusing on the effect of transition probabilities out of employment, numerical simulations reveal that a higher transition rate from part-time to non-employment makes maternity less attractive, particularly when initial wealth is low. From these results appears to be clear that in our model setting higher risk

of unemployment in part time contracts disincentives maternity, since full time positions are preferred in order to avoid undesired episodes of unemployment.

Differences in unemployment risk not only disincentives maternity, but also induces changes on the desired temporal path of types of work when the agent decides to have a children. As it can be seen in fig. 3 , when the probability of unemployment is higher in part time positions and unemployment, the temporary abandon after having a child becomes shorter. Moreover, the preferred permanence time in part time jobs is also reduced, in a more intense way as the difference in unemployment probabilities increases.

The intuition of these results is clear. Reducing the desired time worked or leaving the job market increases the risk of remaining unemployed. This characteristic discourages temporary labor market abandon, and it penalizes part time positions, since it becomes more likely that agent cannot reincorporate labor market in full time jobs when intensive childcare period ends.

Figure 3: Value functions
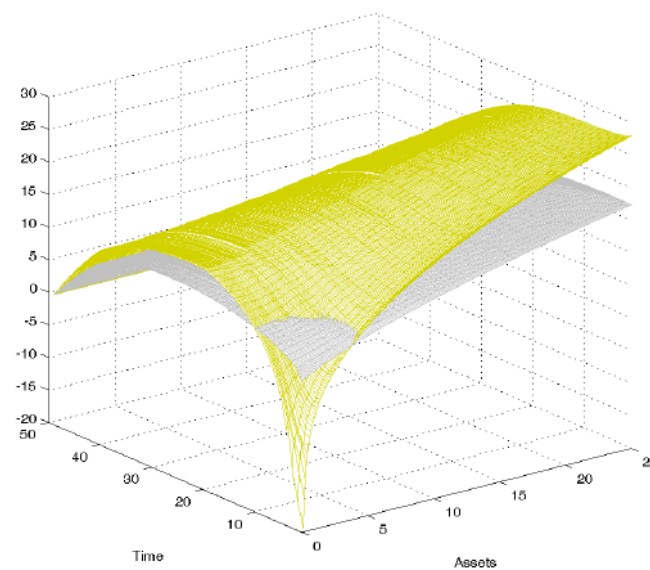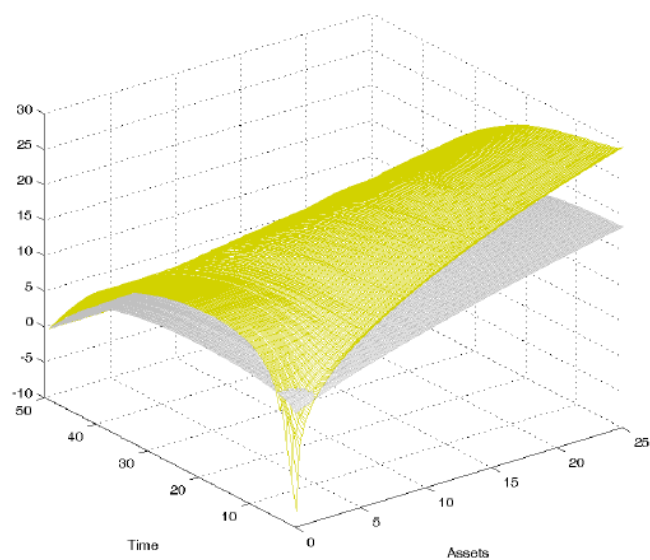
Scenario 1: Equal probabilities irrespective of time of job   Scenario 2: Unequal probabilities

$(p_{FT} = p_{PT} = p_{NJ} = 0.9)$ $p_{FT}(.9) \geq p_{PT}(.7) \geq p_{NJ}(.4)$

Source: Own calculations.

Figure 4 Work time (1 no work, 2 part-time, 3 full-time)

Scenario 1: Equal probabilities irrespective of time of job   Scenario 2: Unequal probabilities

$(p_{FT}=p_{PT}=p_{NJ}=0.9)$ $p_{FT}(.9) \geq p_{PT}(.7) \geq p_{NJ}(.4)$
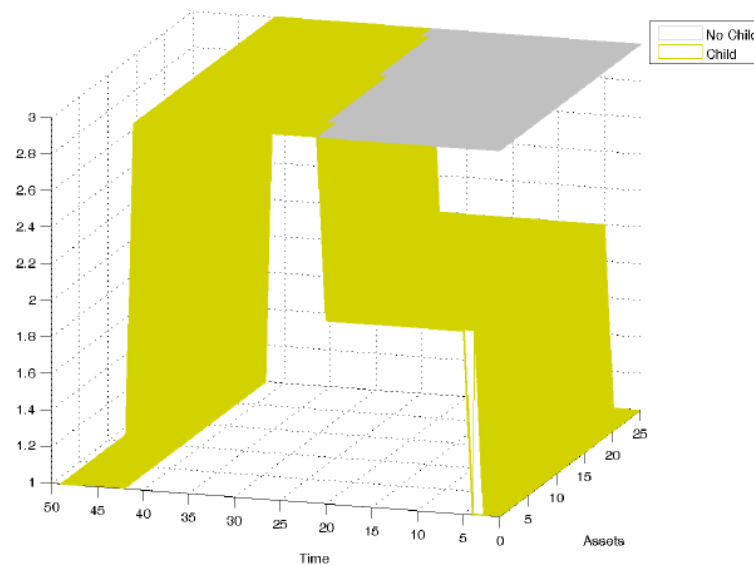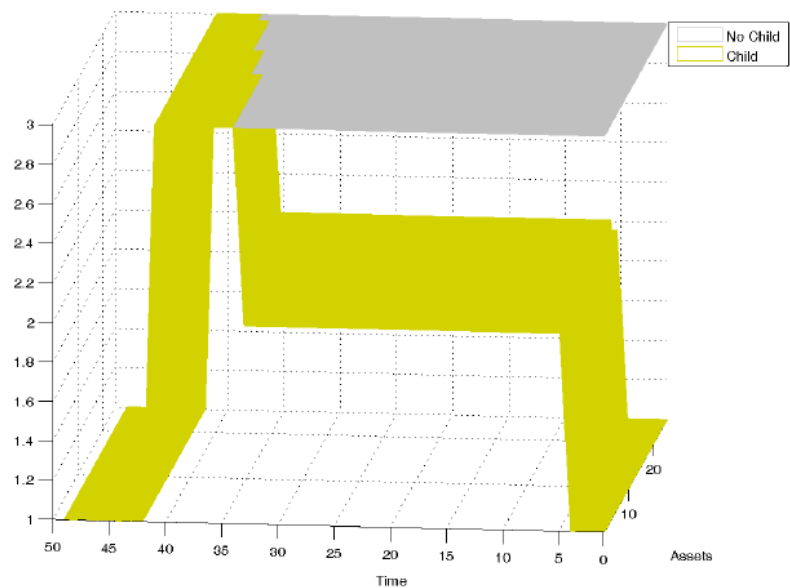
Source: Own calculations.

Figure 5 Optimal asset accumulation

Scenario 1: Equal probabilities irrespective of time of job   Scenario 2: Unequal probabilities

$(p_{FT} = p_{PT} = p_{NJ} = 0.9)$ $p_{FT}(.9) \geq p_{PT}(.7) \geq p_{NJ}(.4)$

Source: Own calculations.
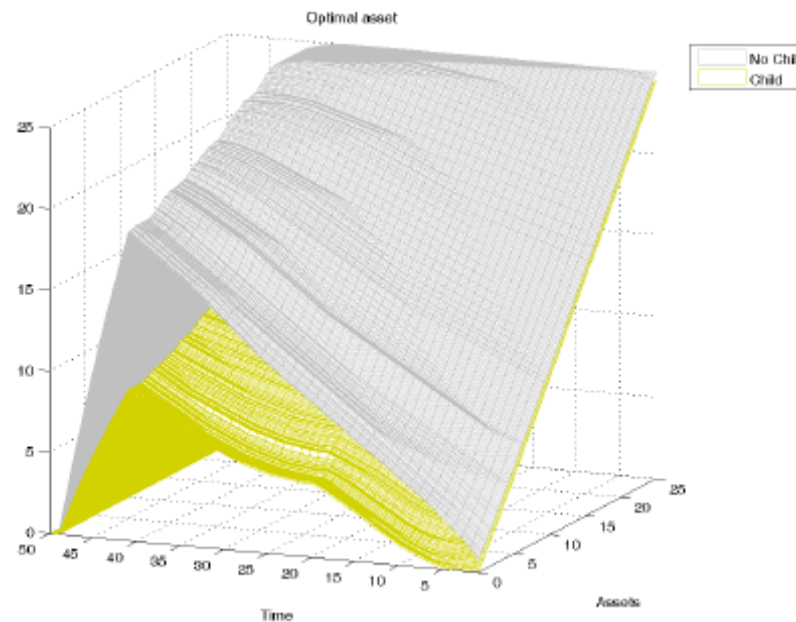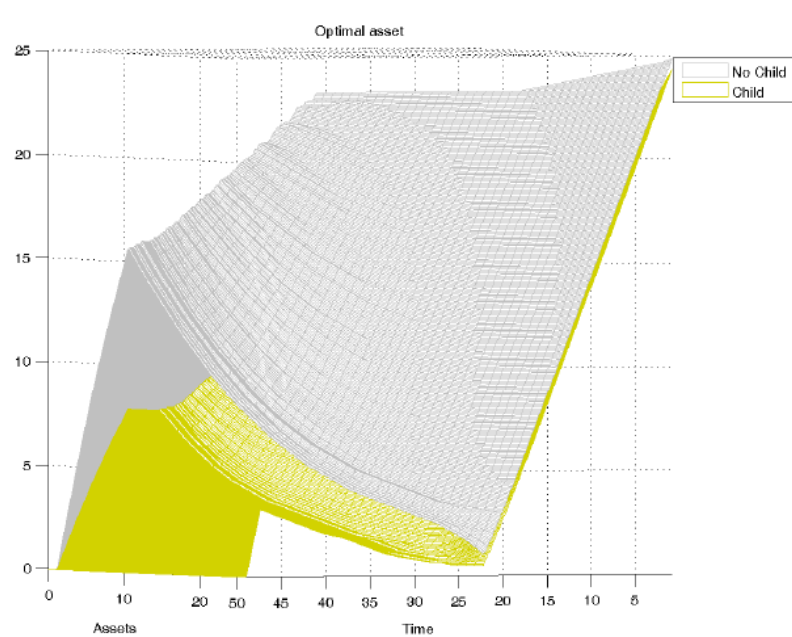
5.- Econometric results

This section is intended to provide empirical evidence on the relationship between childcare activities and the choice of working hours, and the implications for females working career. Since the later implies a dynamic analysis, we use longitudinal data extracted from the European Community Household Panel (ECHP, 1995-2001). Furthermore, the analysis is done for two countries with interesting contrast in the incidence of part-time employment: Spain and the Netherlands. For our purpose, we select a sample of females aged between 20 and 45 years old, living in a couple and who are observed either in employment or non-employment at time t and $t+1$.[20]

Among those women in employment we distinguish between full and part-timers. Therefore, an important issue is how to define part-time work. According to a definition proposed by the ILO, part-time work is regular employment in which working time is substantially less than normal. The same idea is expressed in the European Framework Agreement on part-time work, which was signed by the European social partners in 1997. The range of cut-offs used in some countries to distinguish between full-time and part-time employment and the existence in other countries of definitions based on assessment by the respondent, gives rise to the issue of the comparability of the estimates obtained from these various definitions. A special report for the

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[20] We only consider wage and salary female workers. Furthermore, non-employment includes both unemployment and inactivity.

OECD on the classification of part-time work (van Bastelaer et al., 1997) argued that setting 30 hours as a threshold would lead to a better definition of part-time work for the purposes of international comparisons. Thus, we consider as part-timers those whose weekly hours are below the 30 hours threshold.

Table 4 provides descriptive evidence on yearly transition rates between the different labour market states for Spain and the Netherlands. Some country differences are worth noting. In Spain, part-time employment seems to be just a stepping stone towards full-time jobs. As it can be observed almost 30% of Spanish females that were initially in part-time employment increased the amount of working hours one year later. In the Netherlands this figure is found to be much lower (around 6%). In contrast, a remarkably high share of Dutch females in part-time jobs (around 87%) remains in this state one year later, while the corresponding percentage in Spain is much lower (around 56%). When looking at transitions out of employment, it is worth mentioning that Spanish females exhibit, in general a higher risk of moving towards non-employment than their Dutch counterparts. However, this risk is much higher when females are initially in part-time work. Furthermore, the persistence of non-employment episodes seems to be also higher in Spain. These two facts together could reduce the attractiveness of part-time work for Spanish females who need to conciliate professional life and childcare responsibilities.

	The Netherlands			Spain		
	Part-time	Full-time	NE	Part-time	Full-time	NE
Part-time	87.18	5.9	6.91	56.42	27.21	16.36
Full-time	15.98	80.94	3.07	3.48	84.88	11.64
NE	16.53	1.48	81.98	3.33	6.68	89.99

Table 4: Yearly transition rates (ECHP, Pool 1995-2001)

For a more in depth analysis on the role of maternity on females' working life, we follow Cappellari and Jenkins (2003). We use a first-order Markov model that allows us a series of important controls: for endogenous initial conditions and selection into employment. Furthermore, we account for the presence of repeated observations of the same individual in the pooled transitions by using a robust variance estimator. First, when modelling transition probabilities, it is important that the *initial conditions* problem is addressed (Heckman, 1982a). We can view this as an endogenous selection problem: unobserved factors affecting transitions between states may be correlated with those determining the original state. Second, since the possibility that employees may not be a random subset of the total population could bias our results, we also correct for *sample selection* (Heckman, 1974; Keane et al, 1988).

We denote e_{it}^* the probability of employment at t, that can be expressed as follows:

$$e_{it}^* = \beta' z_{it} + \varepsilon_{it}, \quad \varepsilon_{it} \sim N(0,1) \quad (1)$$

Let E_{it} be a dummy variable indicating whether the individual i is employed in year t:

$$E_{it} = \begin{cases} 1, \text{ if } e_{it}^* > 0 \\ 0, \text{ if } e_{it}^* \leq 0 \end{cases}$$

For those individuals employed in year t, we can observe their working hours. Let us assume that the choice of working hours in year t is specified according to the following equation:

$$f(h_{it}) = \gamma' m_{it} + u_{it}, \quad u_{it} \sim N(0,1)$$

Considering τ_t as the part-time threshold for year t, established as 30 hours per week, the probability of being in part-time employment at t can be expressed through the following equation:

$$p_{it}^* = \delta' m_{it} + v_{it}, \quad v_{it} \sim N(0,1) \qquad (2)$$

where $p_{it}^* \equiv f(\tau_t) - f(h_{it})$ and $v_{it} \equiv -u_{it}$. We define the part-time indicator P_{it} as follows:

$$P_{it} = \begin{cases} 1, \text{ if } p_{it}^* > 0 \\ 0, \text{ if } p_{it}^* \leq 0 \end{cases}$$

For year $t+1$, we have the following expressions for the chances of employment and part-time respectively:

$$e_{it+1}^* = E_{it}\left(\lambda_1' j_{1it} + \theta_e P_{it}\right) + (1 - E_{it})\lambda_2' j_{2it} + \varpi_{it+1}, \quad \varpi_{it+1} \sim N(0,1) \qquad (3)$$

$$l_{it+1}^* = E_{it}\left(\varphi_1' k_{1it} + \theta_l L_{it}\right) + (1 - E_{it})\varphi_2' k_{2it} + \eta_{it+1}, \quad \eta_{i+1} \sim N(0,1) \qquad (4)$$

where the vectors j_{1it} and k_{1it} contain all the personal characteristics in j_{2it} and k_{2it} respectively, plus some job attributes. We define the corresponding employment and part-time indicator variables, E_{it+1} and P_{it+1} as follows:

$$E_{it+1} = \begin{cases} 1, \text{if } e_{it+1}^* > 0 \\ 0, \text{if } e_{it+1}^* \leq 0 \end{cases}$$

$$P_{it+1} = \begin{cases} 1, \text{if } p_{it+1}^* > 0 \\ 0, \text{if } p_{it+1}^* \leq 0 \end{cases}$$

In addition, we assume that the unobservable factors in equations (1)~~(1)~~ - (4)~~(4)~~ are jointly distributed as four-variate normal with zero means, unit variances, and unrestricted correlations:

$$\left(\varepsilon_{it}, v_{it}, \varpi_{it+1}, \eta_{it+1} \right) \sim N_4 \left(0, \Sigma \right)$$

The four-variate probit model is estimated by maximum likelihood for the two abovementioned countries, using pooling annual transitions from the ECHP (1995-2001). The likelihood function involves normal integrals of various dimensions, the largest being four. Therefore, the estimation of the model requires evaluation of multivariate normal probability distribution functions. In order to solve this computational problem, we use the Geweke-Hajivassiliou-Keane (GHK) simulator.[21] As we have repeated observations for individuals making more than one transition and, as a consequence, the i.i.d assumption is violated, we used a Pseudo Simulated Maximum Likelihood (PSML) estimator.

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[21] The GHK simulator works by taking draws from upper truncated univariate standard normal distributions, and then recursively computing a multivariate probability value using Cholesky factorization.

We use personal and family characteristics as explanatory variables for the employment chances (age, level of education, level of education of the partner, a dummy indicating there are children between 12 and 15 years in the household, a dummy indicating whether the individual suffer some type of illness or disability, and a dummy to indicate there is a newborn child in the household). And we include in the part-time equations both personal (age, level of education, level of education of the partner, a dummy to indicate there is a newborn child in the household) and job characteristics (a dummy indicating whether there is child-minding or creche provided by the employer – free or subsidized - , occupation and activity dummies).

Table 5 reports the estimation results of the four-probit model for Spain.[22] As our main interest is on the effect of maternity on females' professional life, we look at the estimated coefficient of the variable "newborn child".[23] This coefficient is found to be negative and significant in the employment chances at t, which suggests that maternity reduces females' probability of remaining employed within the next year after the child birth. This variable also exerts a negative effect on the employment chances at $t+1$, but it is not significant anymore. The later could be explained as follows: if females decide to exit the labour market to take care of their children, this decision will probably be undertaken immediately after child birth. When looking at the full-time

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[22] In Spain we estimate a full-time equation instead of part-time, since the small sample size of females in part-time work gave some convergence problems.

[23] This variable identifies females in period t who had a newborn child between $t-1$ and t

equations, it can be notice that the presence of a newborn child does not significantly affect the choice of working hours, once females are in employment. The estimation results for the Netherlands are presented in Table 6. In contrast to the case of Spain, maternity does not seem to induce Dutch females to abandon the employment situation. However, it significantly increases the likelihood of reducing the number of working hours, not only within the year after child birth but also two years later.

Table 5: Four-probit estimations (Spain, pool 1995-2001)								
	Employment at t		Employment at t+1		Full-time at t		Full-time at t+1	
	Coeff	t	Coeff	t	Coeff	t	Coeff	t
Age								
20-30								
30-35	0,057	0,93	0,022	0,42	0,085	0,75	-0,072	-0,60
35-45	-0,018	-0,31	-0,009	-0,19	-0,049	-0,45	-0,096	-0,87
Education								
Primary								
Secondary	0,511	11,55	0,206	2,97	-0,137	-1,21	-0,019	-0,16
Tertiary	1,145	23,20	0,486	3,58	-0,373	-2,18	0,110	0,57
Education of partner								
Primary								
Secondary	0,106	2,28	0,006	0,13	-0,013	-0,14	0,035	0,35
Tertiary	0,338	7,28	0,044	0,79	0,018	0,18	-0,025	-0,23
Newborn child	-0,223	-2,70	-0,114	-1,48	-0,086	-0,55	-0,088	-0,50
Disability	-0,163	-2,03	-0,167	-2,28				
Children 12-15	0,348	9,19	0,106	2,36				
Employer-provided creche					0,661	3,38	0,163	0,82
Sector of activity								
Industry								
Servic1					0,008	0,06	0,105	0,61
Servic2					-0,036	-0,26	-0,022	-0,13
Servic3					0,093	0,69	0,195	1,22
Occupation								
O1					0,255	0,73	0,289	0,49
O2					0,161	1,23	-0,205	-1,28

	Employment at t		Employment at t+1		Full-time at t		Full-time at t+1	
O3					0,080	0,62	-0,052	-0,33
O4								
O5					-0,257	-2,23	-0,220	-1,47
O7					0,010	0,05	-0,066	-0,30
O8					0,149	0,57	0,090	0,32
O9					-0,633	-5,13	-0,440	-2,53
Full-time at t			1,748	12,40			2,383	9,49
Constant	-1,069	-18,86	-0,929	-7,65	1,679	6,08	-0,592	-1,08
N				6624				
Log pseudolikelihood				-6789				

Table 6: Four-probit estimations (the Netherlands, pool 1995-2001)								
	Employment at t		Employment at t+1		Full-time at t		Full-time at t+1	
	Coeff	t	Coeff	t	Coeff	t	Coeff	t
Age								
20-30								
30-35	0,001	0,02	0,042	0,64	0,627	5,08	0,393	3,42
35-45	-0,069	-1,06	-0,058	-1,04	0,808	5,90	0,380	4,02
Education								
Primary								
Secondary	0,662	4,87	0,614	4,65	0,430	2,35	-0,037	-0,20
Tertiary	1,189	7,22	1,198	7,83	0,517	2,28	-0,274	-1,16
Education of partner								
Primary								
Secondary	-0,067	-0,45	0,007	0,05	0,182	0,99	0,408	2,33
Tertiary	-0,122	-0,74	-0,027	-0,17	0,149	0,76	0,526	2,83
Newborn child	0,183	1,92	0,172	1,81	0,244	2,25	0,729	4,22
Disability	-0,264	-3,39	-0,309	-4,52				
Children 12-15	0,608	9,23	0,537	7,90				
Employer-provided creche					-0,379	-5,46	-0,350	-4,34
Sector of activity								
Industry								
Servic1					0,172	1,30	0,171	1,14
Servic2					0,125	0,96	0,026	0,17
Servic3					0,381	3,00	0,480	3,23
Occupation								
O1					-0,681	-3,92	-0,545	-2,58
O2					-0,391	-3,52	-0,438	-3,37
O3					-0,137	-1,62	-0,202	-1,92
O4								
O5					0,135	1,42	-0,026	-0,23

O7					-0,237	-0,86	-0,319	-1,30
O8					-0,076	-0,33	-0,269	-1,03
O9					0,285	2,12	0,369	2,47
Full-time at t			0,177	0,70			1,795	10,50
Constant	-0,435	-2,40	-0,448	-2,58	-1,332	-4,77	-1,247	-4,11
N				4344				
Log pseudolikelihood				-5995				

6.- Conclusions

Part time contracts are traditionally viewed as an efficient instrument to promote the conciliation between professional and familiar life. However, labour market data shows that part-time work is not equally distributed across gender and age groups, nor across countries, sectors or occupations. Furthermore, part-time workers are very often at a disadvantage in terms of wages, quality of positions, career prospects, etc. compared to their full time counterparts.

In spite of having been designed to promote the conciliation of professional life and relative, part time contracts might give rise to new forms of gender discrimination and thus be detrimental to the quality and the stability of job, mainly for the women collective. As a consequence, this form of employment would become less attractive for women with child care responsibilities. This would explain why in some countries full-time employment is the preferred option for women who wants to remain in the labour market.

In this paper we focus on the effects on female career prospects of the existence of differences in the transition rates into unemployment between part and full-

timers, and the subsequent persistence of unemployment episodes. Motherhood imposes female to decide whether to continue at work or to leave the labour market. When the former decision is taken, women would decide whether working part- or full-time. All these decisions can be of paramount importance for females' future career path, and can be significantly affected by labour market conditions. In an environment where transition probabilities out of employment are significantly higher for part-timers compared to full-timers, part-time employment would be perceived as less attractive.

Comparing data coming from Netherlands and Spain, it can be seen that Spanish females exhibit, in general a higher risk of moving towards non-employment than their Dutch counterparts. Moreover, this risk is much higher when females are initially in part-time work and the persistence of non-employment episodes seems to be also higher in Spain.

Higher unemployment risk in part time work could reduce their attractiveness, in special for females who want to conciliate professional life and childcare responsibilities. For a more in depth analysis on the role of maternity on the transition rates between part-time, full-time and non-employment, we use a first-order Markov model of labour market transitions.

Our results suggest that for Spain, maternity reduces females' probability of remaining employed within the next year after the child was born, but it's effect in employment probability is negligible in subsequent periods. Moreover, we found that the presence of a newborn child does not significantly affect the

choice of working hours, once females are employed. In other words, it seems that women in Spain after having a child quit the labour market or remain in full time positions.

In contrast, maternity does not seem to induce Dutch females to abandon the employment situation. However, it significantly increases the likelihood of reducing the number of working hours, not only within the year after the birth but also two years later.

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