Time use between work and family over the life-cycle: a comparative gender analysis of Italy, France, Sweden and US

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ABSTRACT

The aim of this comparative work is to identify and analyse the cross-country disparities on time use over the life course in France, Italy, Sweden and United States, using most recent data available from the Time Use Surveys. We focus on gender differences in the allocation of time to market work, domestic work and leisure over the life-cycle. In order to describe the life-cycle, we select the adult population between 18 and 80 years old, and distinguish between nine typologies according to age and family structure. These typologies are not exhaustive, but they describe the main stages of life of most individuals (they include more than 80% to 90% of the whole samples, depending on country). This approach helps us to make cross-country comparison of life-cycle stages determined by major life-events, such as exiting the family of origin, union formation, childbearing, and retiring from work. Men and women profiles by life stages vary everywhere, but with different degrees, depending on the welfare regime, family and employment policies, the tax system as well as social norms.

We then analyse to what extent changes in household composition over the life course affect the gender allocation of paid and unpaid work and leisure by using appropriate regression techniques (Tobit with selection, Tobit and OLS).

Keywords: time use, gender, life-cycle, paid and unpaid work

1. Introduction

In many Western countries, the burden of housework and care still remains mainly on women's shoulders, in spite of their increasing participation to the labour market. Hochschild (1989) called "*stalled revolution"* this situation where higher women employment rate is not followed by men's increasing responsibility for domestic chores and care. If this situation is almost generalised, the extent of gender differences across countries is not the same, according to the welfare regime, family and employment policies and tax system, as well as, of course, social norms.

Gender differences can also varies remarkably at various life stages. Several studies carried out in numerous countries show that men and women profiles by life stages vary virtually everywhere, but with different degrees (e.g. Anxo 2004 for France and Sweden; Apps and Rees (2005) for Australia, UK and Germany). Strong differences in time use by gender among countries are related also to timing at key-events in life-cycle. One is leaving parental home (occurring later in southern European countries) that affects not only union formation and childbearing of young adults, but also living arrangements of older parents remaining, at relatively young ages, in the so-called "empty nest" more often in Northern European countries.

One of the most important transition in one's life course is the entry into parenthood. The experience of parenthood often implies a sort of crystallization of gender roles, with an increase of female time spent in housework and childcare, as well as a decrease in leisure time. The double active presence at home and in the labour market for working mothers produce what it is called as *dual burden*. As it is well known, the combining work and family is more difficult for a mother, than for a father, and often the strategies adopted are completely different: men typically increase the time devoted to paid work and women decrease their working time or even exit the labour market (Pailhé and Solaz, 2006). Indeed, having children can seriously compromise women's job opportunities and careers (Mincer and Polachek, 1974). This situation can in itself drive some women to reduce the number of children they have or even induce them to forego altogether (Matthew 1999, Scisci and Vinci 2002). It is not difficult to observe that the Western countries with a very low fertility are the ones with a less equal gender system compared with countries where fertility is relatively higher (counterpoising the countries of the South with those of Northern Europe, for instance).

The differences in fathers and mothers' time use can be wider or smaller according to different context, thanks to regulation of parental leave, the presences of subsidised care services for children and more in general to the nature of family policies. For instance, gender difference in time use can be reduced by policies aimed at reducing the "reconciliation costs", while they can be increased by a taxation system discouraging female labour participation.

Also prevalent social norms may affect gender differences across country. For instance, in a more traditional environment women and men, according to the hypothesis of "incompatibility of roles", can perceive the problem of reconciliation between working activity and family differently (Lehrer and Nerlove, 1986). For men, working activity can be seen as an instrument to exercise their role of *providers,* according to prevalent social norms, whereas for women, social norms have traditionally prescribed the role of family *carer.* Time spent for remunerate work outside the family can therefore conflict with that spent for the family, at home.

The aim of this paper is to analyse how different institutional contexts influence gender relation over the life cycle. In particular, we focus on gender differences in the allocation of time to market work, domestic work and leisure, simulating various stages of life-cycle. Three European Countries –namely Italy, France and Sweden– and the United States are selected for cross-country comparison. They represent different institutional contexts and diverge significantly in terms of welfare regimes, employment policy, family policy and social norms. We distinguish nine life-cycle stages according to age and family structure, that describe the major life events and stages of life of most individuals, such as exiting the family of origin, union formation, childbearing, and retiring.

This approach helps us to make men and women profiles by life stages vary everywhere, but with different degrees, depending on the welfare regime, family and employment policies, the tax system as well as social norms.

The article is organised as followed. The first part presents the different institutional contexts of the four countries chosen. We then describe the data we use, the most recent national Time Use Surveys, and the typologies of families that we focus on. We then analyse to what extent changes in household composition over the life course affects the gender allocation of paid work, housework and leisure by using descriptive analysis and appropriate regression techniques (Tobit with selection, Tobit and OLS).

2. Different institutional contexts

The four countries selected belong to different models in terms of welfare state, labour market regulation and family support, reconciliation between childbearing and work activities.

Often presented as the ideal type of the so-called Nordic social democratic regime, the Swedish Welfare State, emphasizes the principle of egalitarianism, de-commodification[1] and individualisation[2] (Esping-Andersen, 1999). The Swedish model is based on a strong political commitment to the goal of full employment, price stability and to egalitarian ideals (Anxo and Niklasson, 2006). Sweden stands out as providing one type of societal system based on high employment rates with small gender gap and a high incidence of dual earner households, egalitarian wage structures, including low gender wage inequality, extensive and generous family policy, strong welfare support systems both for childcare and parental leave[3] (tables 1 and 2). Individualised taxation systems in a context of high average and marginal tax rates reinforce the dual breadwinner model. As far as working time is concerned, some gender differences persist with a relative high share of women working part-time, but in contrast to other Member States with high part-time rates like the UK or the Netherlands, many women in Sweden work long part-time and receive income compensation for working reduced hours. The development of part-time work among Swedish women, that started in the early 1970s is symptomatic: in 1981 47% of Swedish women worked part-time, compared to 33% in 2005. Part-time work in Sweden must be considered more as an historical transition from married women's inactivity towards a strategy, largely initiated by labour market and political institutions, to strengthen women's labour market commitments. The parental leave system allows for income compensated temporary reduction of working time, thereby reinforcing women's bargaining power and status as a significant breadwinner even when they are temporarily not participating on a full time basis in the labour market. The overall political context characterized by gender mainstreaming, high female involvement in the political process and instances (Government bodies, parliament, and labour market organisations) creates a favourable institutional set up conducive to a more balanced gender division of labour and responsibilities over the life course.

France occupies an often contradictory position in the classification of Western welfare systems, partly because of the variegated nature of its family policy. As Caldwell and Schindlmayr (2003:255) put it, "France remains a problem for the model builders". According to Esping-Andersen (1999) classification, France belongs to the conservative welfare state, which have policies geared at preserving existing statuses and traditional family forms, and depend mostly on the family to provide welfare widely. Feminist researchers, who focus on the impact of social policies on female employment, group France and Sweden together, as countries where social

[1] Strategies of decommodification are aimed at making people more independant of markets by insulating the satisfaction of wants and needs from the nexus of market transactions.

[2] Individualization has been a key part of the Swedish universal welfare state: the individual, and not the family, has for many years been the unit not only of taxation but also of social benefits as social rights.

[3] Sweden is the country with the lowest general gender gap all over the world and the highest GEM-Gender Empowerment Measure Index (UN, 2005)

policies help women stay in the labour force (Neyer, 2003; Gornick, Meyers and Ross, 1997). The activity rate of French adult women started to rise for generations from the mid-1950s onwards, but there is still a pronounced 'cohort effect' whereby younger generations of mothers have more continuous participation profiles across their working lives than their predecessors. This life course pattern for French mothers is supported by the high coverage rate and lower cost of public childcare than available in many countries, but in contrast to Sweden provisions are less extensive (table 2). However, unemployment has been high in France since the 1980s, and unemployment rates for women consistently exceed those of men (even among the younger cohorts). Thus, while the gender gap in employment rates continues to fall it remains more difficult for women to establish and pursue a continuous employment profile over the life course; motherhood is still associated with withdrawal from the labour market for some groups of women (Anxo et al, 2006; Pailhé and Solaz, 2006).

Italy is one of the Mediterranean countries, which are like conservative states, but with a stronger family bias (Southern-European welfare state), where public support is limited and there is a greater reliance on family relations to provide social support. A high level of rigidity characterizes the Italian labour market, with a strong protection for those in long-term employment, and very little protection for those in temporary employment. These rules severely restrict opportunities for labour-market entrants, a feature which has been claimed to be the main reason for high unemployment rates among women and young people (Del Boca *et al.*, 2005).

Young people quit parental home late, owing to both cultural reasons and structural constraints, as high unemployment, low entry salary and lack of state support (Barbagli *et al.,* 2003). Women play a crucial role as carer for both the young and the old members of the family, scarcely supported both by their partners and by public services. The employment rate among mothers with children under the age of 3 is only 54 percent, one of the lowest in Europe (table 1). Married women are often forced to choose between not working or working full time (Del Boca *et al.*, 2003), In fact, flexible working hours and part-time work are rare: for instance, less than 30% of mothers of children under 6 years old work part-time (table 1).

Reconciliation between childbearing and work activities is made more difficult also by the limitation in the supply of public childcare for children under 3 years old, both in terms of availability (only 6% of children attend a public crèche) and in the number of hours offered on a day-to-day basis (table 2). Conversely, with respect to the other countries, maternity leave duration is quite long (21 weeks) and paid at 80% of the salary (table 2). As gender roles are still shaped in a traditional way, paternity leave have never been enacted, but since 2000 both fathers and mother can take parental leave, for a total period of 36 weeks, at 30% of their wage (law 8 March 2000). A further month is given if the father takes at least three months of paternal leave.

The United-States belong to the English-speaking countries which follow a 'liberal' welfare regime. This system is predicated on the belief that the market can service most needs and will inevitabely reduce poverty, and that welfare may impede the efficient functioning of the market. The United-States have a strong institutionalized working-culture and the free market and the family have a dominant role to provide welfare. Welfare is a safety net, confined to those who are unable to manage otherwise. The US does not, however, have a unified welfare system. Central government has had a limited role in social welfare provision; many important functions are held by the States, including public assistance, social care and various health schemes. In practice, the US is pluralistic, rather than liberal.

The high flexibility of the US labour market provides low unemployment and a greater chance for the young to have a job. Family steps are then advanced. But uncertainty prevails also during working lifetime compared to the relative security of Central and Southern Europe. "Population have become inured to being economic and demographic risk-takers" (Caldwell and Schindlmayr 2003). In contrast to Sweden and France, the US family policy is weak. Government does little to help workers to attend to family responsibilities, except for the poorest (see table 3). Policy is predominantly in a liberal vein, giving incentives for private service provision in the form of tax

deductions for childcare (Orloff, 2006). A national parental leave has been enacted in 1993 but it is unpaid[4]. In spite of the fact that re-entry into the labour market after a birth is easy, many parents continue to feel economic and job-risk pressures. So they to return to work sooner than they are ready to. Only 36% of mothers has taken such a leave (Waldfogel, 2001). The US have the 7th rank of the gender empowrement measure index according to indicators such as the number of seats in parliament held by women, the ratio estimated female to male earned income,.. (Sweden is the third, and Italy the 32th). The U.S. average female-male earnings ratio has shown considerable progress since the 1970ies and the wage gap is close to its northern countries level (Datta Gupta, Oaxaca and Smith, 2001).

Table 1: Employment indicators

	Female employment rate	Employment rate Women with child <3	Part time employment rate Women with child <6	Male employment rate 25-54	Female employment rate 25-54	Male employment rate 55-64	Female employment rate 55-64	Mean age at withdrawal from labour force. Men	Mean age at withdrawal from labour force. Women
Sweden	71.5	72.9	41	86.1	80.8	71.6	67.4	63.1	62.4
France	56.7	66.2	23	87	72.9	44.5	36.8	58.4	59.4
United States	65.4	56.6	29	86.3	71.8	66	54.3	62.2(a)	62.2(a)
Italy	42.7	54.4	29	86.6	57.9	44.2	19.8	60.9	61

(a) Average 1995-2000

Sources: OECD Employment database; OECD Society at glance (2005); OECD Employment Outlook (2006)

Table 2: Family policy indicators

	Total expenses for child care (% GDP)	Childcare expenses (per child, US PPP)	Childcare attendance rate (1-2 years old)	Pre-school establishment attendance rate (3-6 years old)	Maternity leave duration (first birth)	Paid parental leave duration (weeks)	Paternity leave (weeks)	Benefits and tax breaks towards family (% GDP)
Sweden	1.45	5300	65	82	15	51	11	1.78
France	1.6	4000	39	99	16	156	2	2.28
United States	0.65	1800	16	53	12	0	0	0.79
Italy	0.65	2761	6	71	21	36	0	0.64

Sources: OECD Family database; OECD Family and bosses; OECD Education database

3. Time-Use Surveys

Time Use Surveys represent a unique and precious source of information on daily activities. They use time diary technique, where individuals report their time use during the previous 24 hours, providing extremely detailed information on the activity an individual perform during that day. The diary days are randomly distributed across days of the week for both men and women. The diary data are based on a grid of 10 minute-intervals of time, with the description of the main activity carried out by the interviewee, the second (or contemporary) activity, the place and the presence of

[4] The Family and Medical Leave Act (FMLA) requires certain employers to allow eligible workers to take up to 12 weeks unpaid, job-protected leave each year, but the leave is unpaid.

other persons. Beside the diary, all the data sets contain rich sets of information on individuals and household's background and socio-economic situation.

The French data are a representative sample of the French population and the survey was conducted by the French Bureau of Statistics (INSEE) during February 1998 to February 1999. The sample size (individuals between 18-80 years old) amounts to over 12,000 individuals (see table A1 in the appendix).

In Italy, the Time Use Survey was carried out by National Institute of Statistics (ISTAT) in 2002-2003, on a sample of over 55,000 individuals (more than 41,000 aged between 18 and 80; see table A1 in the appendix). The daily diary was filled by all the members of the household aged 3 years or over.

The Swedish Time Use Survey was conducted by Statistic Sweden (SCB) between October 2000 and October 2001, on a sample of more than 7,000 individuals (see table A1 in the appendix). Compared to the other data sets, three main exceptions are worth noting: the survey draws a sample of individuals from a national register and includes only a sub sample of spouses, people gave information for a weekday and a weekend day. Also, only people aged 20 and more were asked to complete the questionnaire.

In United States, the Time Use Survey was conducted by the Bureau of Labour Statistics in 2003 and 2004. Additional variables from the Current Population Survey are available. Only one person from 15 to 80 years old was interviewed in each household, with a sample of more than 33,000 individuals age 18-80 (see table A1 in the appendix). Differently from the other countries here studied, the interviews were conducted by phone.

In this study, we concentrate on three groups of activities:

1) Time devoted to market work. It includes all the activities related to work: time spent in main job, and in secondary job, as well as in other job activities in a broader sense, such as pauses, coffee and lunch break or transport during job activities. However, we do not include commuting that cannot be considered working-time in a proper sense;
2) Time devoted to unpaid work, including the full range of domestic chores and care activities. The domestic tasks include cooking, dishwashing, laundry washing, drying and cleaning, cleanup and maintenance within the house, cleanup, repair and other maintenance outside the house including yard work, purchasing and bookkeeping and household management. Care encompasses childcare, care of other family members as well as pet care;
3) Leisure time. It includes socializing, relaxing, sport, walks, cultural activities, religious and spiritual activities, volunteer activities, conversations, meals outside the house.

4. The phases of life-cycle: similarities and differences across countries and the methodological approach

In order to map the profile of time allocation of men and women at different points in the life course we restrict the samples populations to adult aged 18-80 years old[5] and use a variant of the *family cycle approach* developed by Glick in the late 1940s (Glick, 1947) Our methodological choice has consisted of selecting a range of household categories coinciding with widely experienced transitions and phases in the life course. This typologies can be depicted as results of some steps in one's individual biography: transition out of the parental home (young single living at the parental home) and the constitution of independent household (young singles without children), union formation (cohabiting couples without children), parenting (differentiating couples according

[5] Except for Sweden, where it is between 20 and 80.

to the mean age of children), midlife empty nest period (middle-aged couples without cohabiting children) and lastly the elderly phase and exit out of the labour market (couples and singles older than 59 years old). See the box below for the details of the nine typologies of household life-phases that we focus on in our analysis.

Although our approach is not longitudinal and based on cross-sectional time use surveys, it can serve as a heuristic device to identify cross-country differences in the patterns of labour market integration and the gender division of unpaid work and leisure over the life course and to assess the influence of the societal context on the prevailing gender division of labour. However, one needs to be cautious with the interpretation of the results and bears in mind the usual drawbacks associated with cross-section analysis, in particular the difficulties of disentangling age, cohort and period effects. Furthermore, the family cycle suffers from some limitations that should be stressed. This approach implies a "natural sequence" of predetermined stages in the family's progression from marriage to widowhood; however, this sequencing of life stages is becoming more diversified in contemporary societies. We make no assumptions about sequencing or duration on the different life stage situations we have selected for analysis; rather in our typology we have sought to include some of the most prevalent transitions and life phases for comparative analysis. This typology does not include all the possible household situations and it leaves out important and growing categories such as for example lone parents or prime age and mid-life singles. However, our typology covers between c.a. 80% (Italy) up to 88% (Sweden) of all household categories found in each society at a given point in time (set Table 3 and Table A1 in the Appendix).

This stylised household typology that we have devised provides advantages for cross-country comparisons of the different employment rates, time spend on market work, housework and leisure by gender according to matched household types.

We are aware that there are some caveats of our approach, as the life-cycle stages considered are not (and cannot be) exhaustive, and they do not necessarily occur in the expected order. As much as the individual trajectories become more and more heterogeneous, the predictive value of average time-use profiles weakens. Moreover, families with children are not differentiated according to their number, but only with respect to the children's mean age. Nevertheless, the description of these simple time-use profiles can be a very useful basis for comparative studies, both across time and across countries.

In a comparative perspective it is interesting to assess also whether being in a certain life-cycle period has the same effect on time use for men and women, other things being equal. We therefore estimate three different models with, as dependent variables, time in paid work, time in unpaid work, and time in leisure. Interest variables are our household typologies and control variables include educational level, income or economic situation, regions, urban areas, characteristic of the house (ownership, number of rooms, presence of a garden), access to household services (housekeepers, baby sitter or a carer for older people), other specific characteristics by country (such as ethnicity for US or citizenship for France) and weekday of the interview as control.

For market work, in order to control for potential selection bias and to be able to discriminate between the impact of covariates on participation to market work that day and working hours given participation, we use a Tobit with selection (see Heckman (1978) and the technical appendix for details). For housework we use a standard Tobit to take into account that some individuals do not report housework (zeros). Since in the standard Tobit and the Tobit with selection, the estimated coefficients have no natural interpretation we report marginal effects evaluated at sample means. For leisure a usual OLS is used since there is no zeros, all individuals in our four sample reporting that they spent time on leisure.

Box 1: Stylised household life-course typologies

Single and childless young people

1. Single person (under 36 years), without children living with their parent
2. Single person (under 36 years), without children living on their own

Childless couples

3. Younger couples (woman aged under 46 years), without children

Couple households with resident children

The mean age of the children is used to indicate the nature of parental responsibilities across the life course, from the intense nature of childcare for pre-school children through to the different needs and demands of children as they grow and become more independent.

4. Couple with youngest children (mean age of children is under 6 years)
5. Couple with young children (mean age of children 6-15 years)
6. Couple with teenage children (mean age of children 16-25 years)

Older couples or singles without children living at home

7. Midlife 'empty nest' couples without resident children, (woman aged 45-59 years)
8. Older 'retiring' couples without resident children (both spouses aged 60 years or older)
9. Older 'retiring' singles without resident children aged 60 years or older

Table 3: Countries' samples by household typologies in the life-cycle (weighted proportion)

Individual 18-80 years old	FRANCE	ITALY	SWEDEN*	US
Single <36 with parents	9.0	16.8	1.7	8.8
Single <36 on their own	4.3	2.2	9.4	5.4
Couple <46 no children	6.9	4.7	9.3	8.3
Couple children 0-5	7.6	8.1	15.2	9.5
Couple children 6-15	15.8	12.2	8.9	14.3
Couple children 16-25	11.1	13.1	5.2	7.7
Empty nest 45-59	7.4	3.7	15.5	9.2
Couple 60 +	13.8	12.0	15.1	11.9
Single 60 +	6.1	6.9	7.8	7.2
Total excluded	18.2	20.3	11.7	17.8
monoparental families	5.8	5.3	4.4	5.9
single 36-59	4.6	3.8	7.3	8.1
other excluded	7.8	11.2	-	3.9
Total	12,442	41,440	7,272	33,077

from 20 to 80 years old

5. Employment profile over the life-cycle

First, we examine employment rate. We adopt a relative large definition of employment since we count as employed people, people currently working or temporarily absent from work[6].

[6] People absent for school training, illness, civic/military duties, on vacation, layoff, waiting for a new job to begin, labour dispute, child or family member disease, maternity/paternity or parental leave are included.

For men, employment profiles over the life-cycle are quite close among countries (see figure 1) and follow an inverse U-curve. Men progressively enter the labour force in their youth and reach a very high level when being fathers. Young men living with their parents have a lower employment rate compared with when there are living on their own. Leaving parental home coincide with a financial independence. This effect is particularly strong in France and Sweden, lower in Italy and US since respectively 60% and 70% of males living with their parents are already working. Concerning the following steps, i.e. forming a couple and having children, fathers work a little more than childless men in couple, specially in France, and also in Sweden and US. Familial responsibilities may exert a push effect to find a job, and/or couples may wait that the man has a job before having a child. It is not the case in Italy where the maximum male employment rate is already reached when they form a childless couple. This effect could also come from a age effect since the family steps of Italian people are delayed. Middle age and older men withdraw earlier from the labour market in Italy, due to early retirement schemes. Worth also noticing the employment rate of elderly men is comparatively higher in Sweden and the US, while extremely low in France. In spite of quite comparable minimum legal age at retirement (60 in France, 61 in Sweden, 62 in United States), the conditions of getting a full retirement pension and employment policies differ and explain the main differences in the mean age of withdrawal the labour market between countries (see table 2 for statistics on the mean age of withdrawal from labour force of men). Some other additional factors play. The French low senior employment rate may be explained both by a relatively low retirement age, a large use of pre-retirement schemes[7], a high rate of senior unemployment and by some particular retirement regimes (with earlier retirement age). Indeed, encouraging the exit of elderly from the labour market has been largely used in the 80ies and 90ies as a tool to reduce unemployment. On the contrary, Sweden, has set up a very active employment policy targeted at older workers. Anti-age-discrimination laws that were introduced in the beginning of the 1960s in the United States have protected senior employment rates.

Female profiles differ to men's one in all countries, with some contrasts across countries. In France and Sweden, union formation is associated with an increasing labour participation (see Figure 1), while in Italy, the employment rate of women living in a couple without children is slightly lower than for singles. This suggests that union formation is sometimes associated with a decline of women labour force participation. The arrival of children has a negative impact on female employment in all countries. This decrease is particularly high in the USA (the employment rate fall from 82% to 58%) and Italy (from 74% to 54%). The gender gap is particularly high in those two countries at this stage of life course: it reaches about 40% when it reaches about 20% in France. While in the USA, France and Sweden, the female employment rate increases again when children become older, in Italy it still declines with the age of children. However, more than a life course evolution, it may be analysed as a cohort effect, with older cohorts having a lower participation rate.

If we look now at the quantity of hours spent on market work per week (calculated thanks to the day schedule) for those who are employed, trends are going in the same sense (see Figure 2). The decrease in working hours for women with pre-school children is larger, due to the increasing proportion of women working part-time, taking a parental leave or being on maternity leave when they have young children. The decrease in the quantity of working time is more concentrated around the very first years of children, particularly in France, Italy and Sweden. In Italy, there is a real specialization between men and women, with an increase of working hours of men, not visible in the others countries, where the quantity spent on labour market seems not dependent of the familial situation.

[7] In the face of declining demand and rising unemployment, pre-retirement has been increasingly considered by firms as a way to deal with their excess capacities.

The model confirms the preceding comments. Once controlled by education (that could affects the family and labour calendar), the day of the week, and the town size (which implies different local employment market work) for all four countries and by some additional specific covariates available not in all countries such as predicted wage, non labour income and citizenship in France, ethnicity in US, area in Italy and US, our interest variables -the nine categories of our typology- are still significant. We are going to comment both the impact of these categories on participation to market work (second part of table 4), and the quantity conditionally to the participation (third part), more than the total marginal effect (first part) which is the mean for the whole population and which is less easier to interpret.

The effect of children on male labour market participation is very different between countries. We have no impact of young children for French fathers, while we have a positive impact on labour supply in Italy and the US, and a negative in Sweden. Swedish fathers reduce their labour supply. This effect is probably due to the use of parental leave (even for a short period) and not to a withdrawal from the labour market. There is no impact on the amount of participation once males are participating in all countries.

When children are getting older, American fathers continue to participate more on the labour market (without impact on working time given participation) but there is no more impact on Italian or Swedish fathers' participation. US fathers of children aged 16-25 have a higher labour supply, both in terms of participation and working time. By contrast, French fathers reduce both their participation and their time amount when children are teenagers, which may rather be explained by an age effect. We find a negative effect on participation of the category empty nest in Italy and France. Earlier retirement and pre-retirement plan could explain this fall. Furthermore, unemployment affects also workers on this age whereas in Sweden and United States, anti-discrimination laws and policies protect these categories of workers. People in Empty nest work also less when they participate in France and Italy. Part time work early retirement programs could explain this effect in France. Of course, after sixty years old, the participation decreases dramatically in the four countries whatever the familial situation (single/widow or in couple).

As men, **women** living with their parents participate less (Italian and American) or work less when they participate (French and US) than women having already formed a couple. By contrast, when they are living on their own, women participate more in Italy and the United States. Here, we can probably see the penalty of couple formation on the labour force participation for these two countries, which does not occur for France and Sweden.

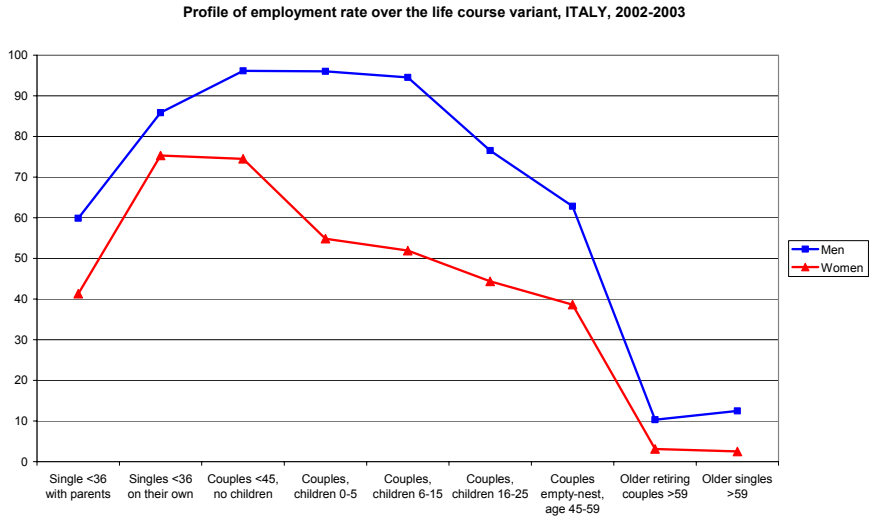
But the strong and universal effect is having very young children which reduces both participation and the amount of working hours, for all women in all countries.

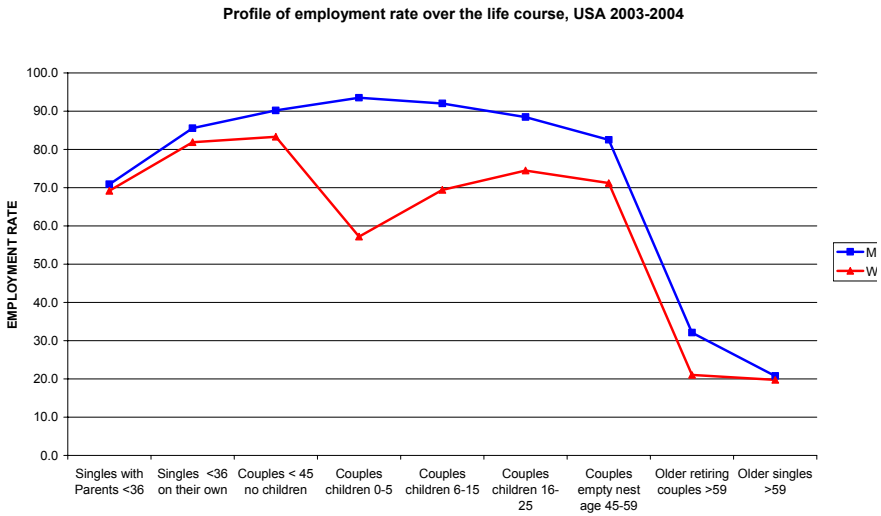
The weaker participation of mothers with older children carries on in Italy (even for teenagers) and the United States. Mothers cumulate both a weaker participation and a lesser investment when they participate (except for US mothers of teenagers who work as much as childless mothers when they participate). In France and Sweden, mothers of children aged 6-15 or older have the same level of participation than childless single women, but they work shorter time when they work (except Swedish mothers of teenagers). In the United States, one strategy available for parents is to stagger their working hours so that at any given time only one parent is working. For instance in 1997, 31% of dual earner couples with children under 14 had at least one parent who worked some schedule other than a fixed day time (Presser 1999).

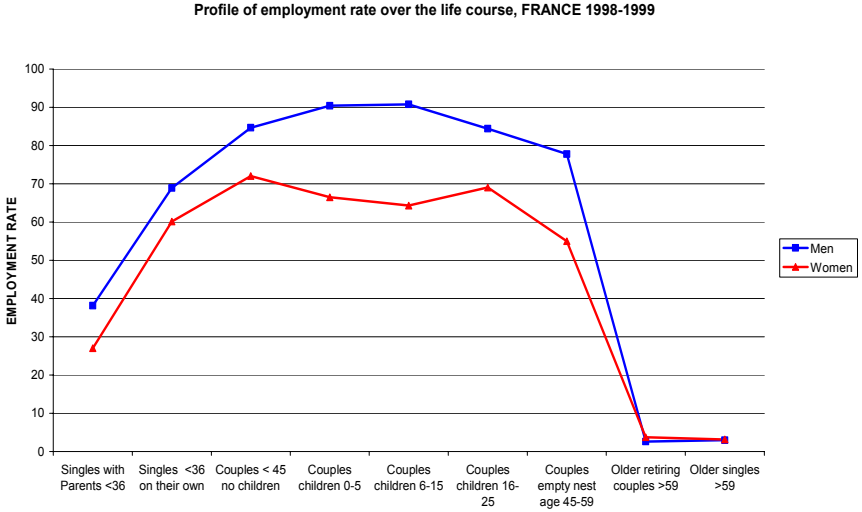
"Empty nest" has a negative impact on women participation in France, Italy and the United States, that could be explained as for men by the less friendly labour market for older women. For women, it could be also explained by a cohort effect (this cohort worked less that younger ones), that we are not able to control with our cross sectional data. When they work, their working time is also lower.

Without surprise, we observe in the four countries a decrease in both participation and the amount of work when the age is going on, for women in couples or singles over sixty.

Figure 1: Profile of employment rate over the life course variant







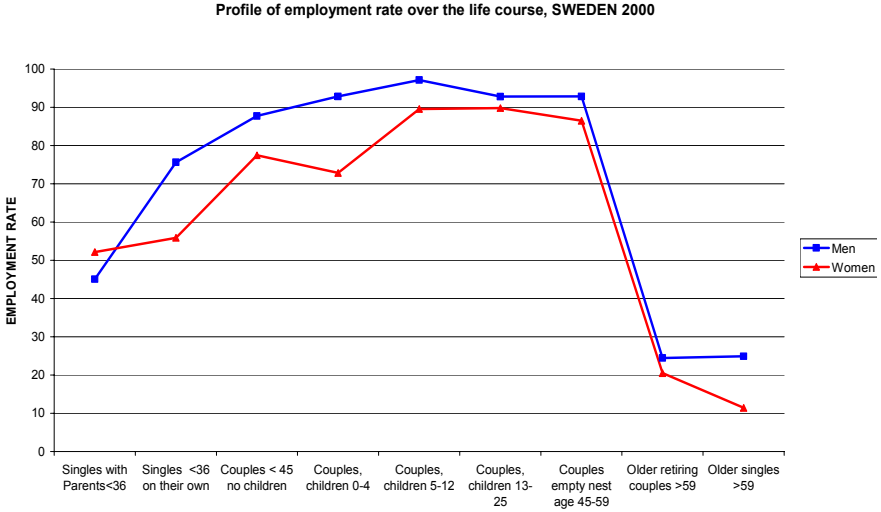
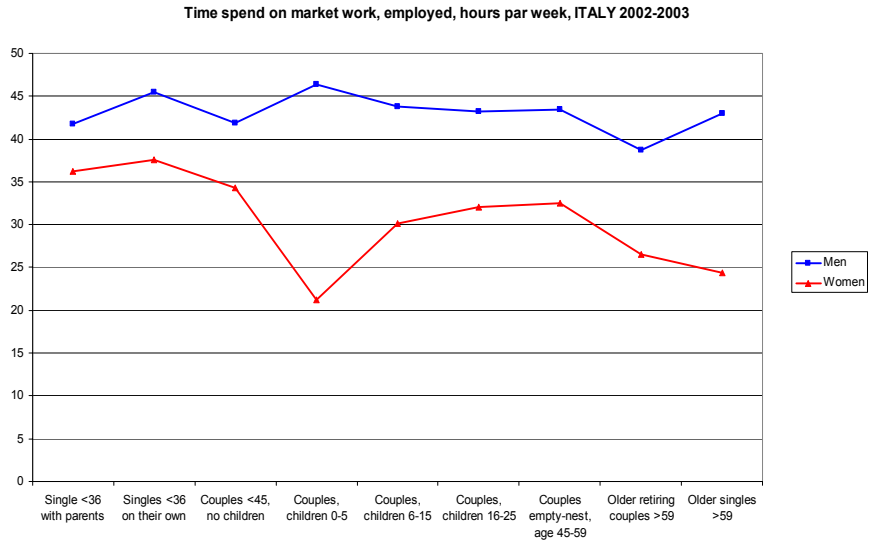
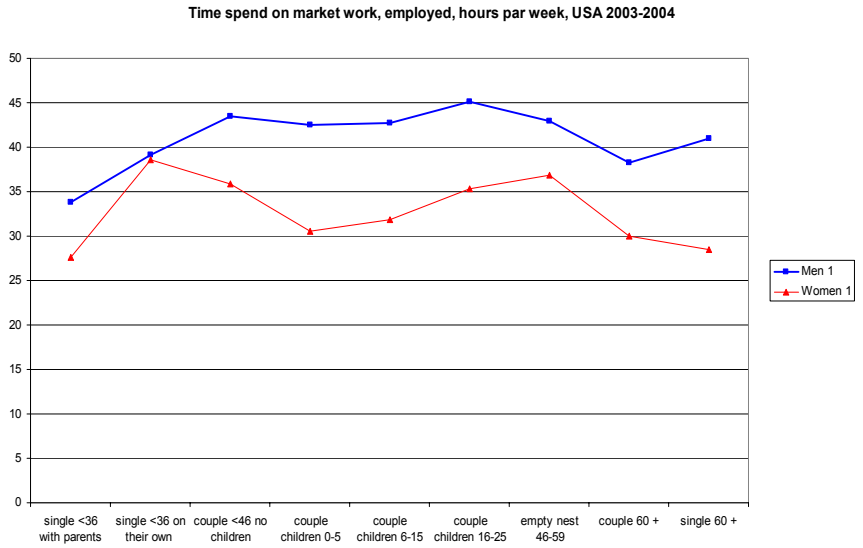
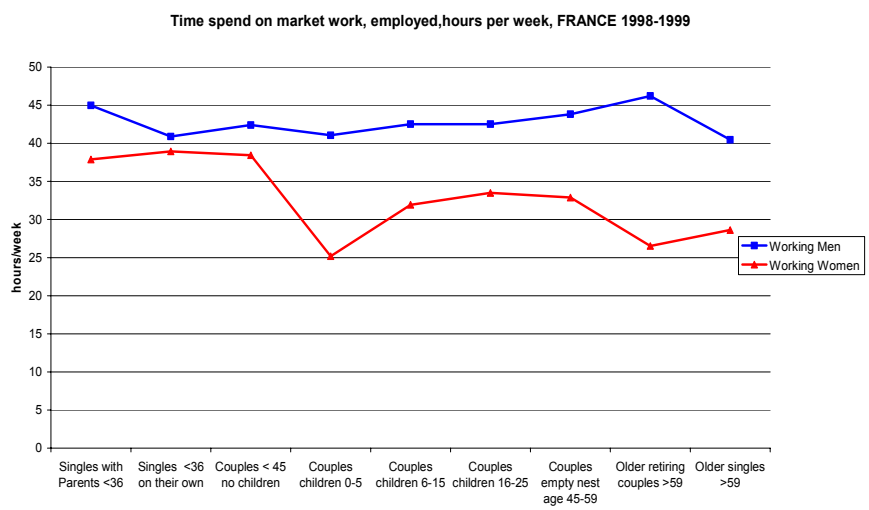


Figure 2: Time spend on market work, employed, hours per week







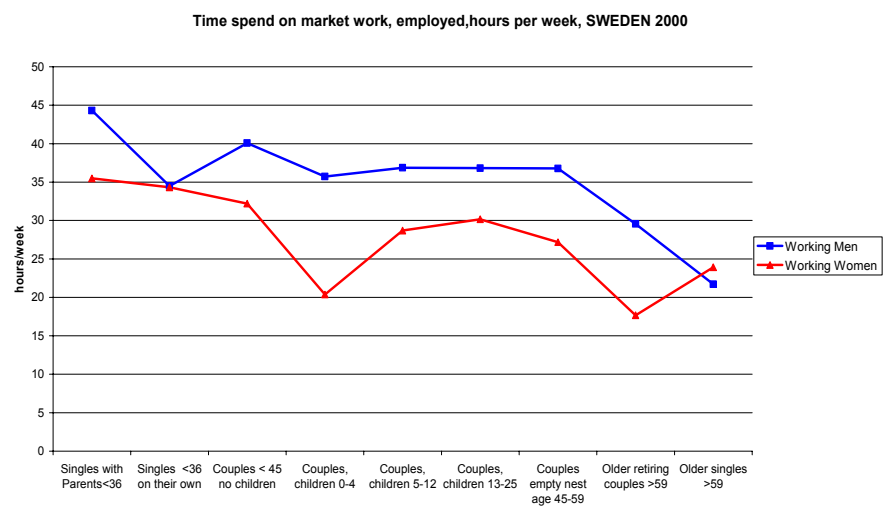


Table 4: Heckman model for market work (evaluated at sample mean) by country and gender

Total marginal effect	**MEN**				**WOMEN**			
	FRANCE	**ITALY**	**SWEDEN**	**US**	**FRANCE**	**ITALY**	**SWEDEN**	**US**
Household life-course typologies (ref.: couple <46 no children)								
Single <36 with parents	***-4.75***	***-9.37***	***-10.82***	***-6.77***	***-1.73***	***-2.55***	3.61	***-3.38***
Single <36 on their own	1.09	-1.37	***-7.21***	1.32	-1.16	1.42	-1.08	***3.87***
Couple children 0-5	-1.85	***2.94***	***-4.16***	***4.99***	***-4.68***	***-3.74***	***-6.21***	***-6.49***
Couple children 6-15	***-4.40***	0.78	-0.92	***5.12***	***-2.62***	***-2.21***	0.28	***-3.25***
Couple children 16-25	***-7.15***	***-4.18***	-2.70	***4.70***	***-2.85***	***-2.35***	0.56	-0.64
Empty nest 46-59	***-8.70***	***-7.95***	-2.03	0.48	***-3.99***	***-3.25***	-0.57	***-1.75***
Couple 60 +	***-26.50***	***-21.53***	***-18.79***	***-17.57***	***-9.87***	***-7.58***	***-12.71***	***-12.14***
Single 60 +	***-19.13***	***-17.31***	***-18.81***	***-18.05***	***-9.18***	***-7.31***	***-12.32***	***-12.41***
Expected value	20.0	17.1	17.6	21.8	7.4	5.3	12.2	12.7

Impact on participation (selection effect)	**MEN**				**WOMEN**			
	FRANCE	**ITALY**	**SWEDEN**	**US**	**FRANCE**	**ITALY**	**SWEDEN**	**US**
Household life-course typologies (ref.: couple <46 no children)								
Single <36 with parents	-0.03	***-0.17***	***-0.22***	***-0.10***	-0.02	***-0.06***	0.10	***-0.05***
Single <36 on their own	0.08	-0.03	***-0.14***	0.02	-0.02	***0.03***	-0.03	***0.08***
Couple children 0-5	-0.03	***0.05***	***-0.07***	***0.10***	***-0.12***	***-0.08***	***-0.10***	***-0.12***
Couple children 6-15	***-0.08***	0.03	0.01	***0.10***	-0.04	***-0.04***	0.04	***-0.04***
Couple children 16-25	***-0.13***	***-0.07***	-0.03	***0.07***	-0.04	***-0.04***	0.02	0.00
Empty nest 46-59	***-0.15***	***-0.14***	-0.02	0.01	***-0.08***	***-0.07***	0.02	***-0.02***
Couple 60 +	***-0.50***	***-0.41***	***-0.35***	***-0.31***	***-0.26***	***-0.17***	***-0.27***	***-0.25***
Single 60 +	***-0.39***	***-0.33***	***-0.36***	***-0.35***	***-0.23***	***-0.17***	***-0.26***	***-0.26***
Expected value	0.42	0.34	0.36	0.43	0.22	0.12	0.27	0.28

Conditional marginal effect	**MEN**				**WOMEN**			
	FRANCE	**ITALY**	**SWEDEN**	**US**	**FRANCE**	**ITALY**	**SWEDEN**	**US**
Household life-course typologies (ref.: couple <46 no children)								
Single <36 with parents	***-8.17***	***-1.80***	0.07	***-5.43***	***-5.70***	0.95	-2.02	***-4.30***
Single <36 on their own	***-5.23***	0.37	-1.97	0.55	-1.85	-0.08	0.95	1.41
Couple children 0-5	-1.40	1.10	-1.46	0.32	***-4.86***	***-7.71***	***-8.18***	***-6.58***
Couple children 6-15	-1.84	-1.60	-3.97	0.54	***-6.69***	***-6.61***	***-4.48***	***-5.42***
Couple children 16-25	***-3.37***	-2.19	-4.00	***2.03***	***-8.54***	***-4.63***	-1.31	-1.53
Empty nest 46-59	***-5.28***	***-3.48***	-2.51	-0.47	***-8.58***	***-3.91***	***-5.55***	***-2.43***
Couple 60 +	***-20.12***	***-6.48***	***-15.01***	***-9.21***	***-16.30***	***-9.30***	***-10.75***	***-10.92***
Single 60 +	***-10.25***	***-6.16***	***-22.64***	-2.73	***-23.16***	***-6.18***	***-10.89***	***-8.14***
Expected value	47.5	51.1	48.6	50.2	33.9	43.3	44.4	44.1

Controlled by education, town size, weekday in all countries, plus predicted wage, non labour income, citizenship (France), ethnicity (US), area (Italy and US)
Bold= coefficient significant at 5%

6. Time spent in unpaid work over the life-cycle

The amount of time that people spend in unpaid work (housework and care activities) varies considerably across countries (Figure 3). Italian women are those spending more hours on it virtually at any step of the life cycle (between 12 and 51 hours per week), followed by the French. Conversely, Swedish women devote remarkably fewer hours to these activities (from 8 to 29 hours per week). American women are usually in between, but they work at home more hours than the French ones when they have children under three years old. Women's time spent in unpaid work increases with union formation everywhere, but particularly in Italy and France. Not surprisingly, in any country women's profiles show a peak in correspondence with the presence of very young children in the family. In general, women decrease their involvement in domestic activities only when they live alone in the final phase of their life cycle (the "merry widows"?).

Men usually spend less time on housework and care: Apart from very few exceptions (the older) their involvement is always less than 20 hours a week (Figure 3). Moreover, the profile of their participation is quite flat over the life-cycle and more similar across-country. The number of hours they spend on housework and care increases significantly only after retiring and for those living alone at older age (the "unhappy widowers"). In three countries out of four (the US are the exception) over-60-year-old men devote to unpaid work more hours than the younger men, even when the latter are fathers of very young children.

The gap between men and women's participation in domestic chores and care activities exists in all countries at any stage of the life course (Figure 3). It is usually less remarkable at the extreme phases of the life cycle: among the very young, not in couple, and at older ages, especially among singles. In France and in Italy the gender gap increases with union formation. Gender differences are extremely wide for the Italian at any step of the life cycle, but in particular when they are in couple with children: Italian women with children under three years old work on average 40 hours a week more than men in the same typology of family, while in Sweden only 11 hours more. In Italy the gender gap is noteworthy (about 10 hours a week) also among the young living both in the parental home and alone, as well as among the widowed. The opposite case is represented by Sweden where the gender differences are never remarkable and in no case they count for more than 11 hours. French and American women are somewhere in between: the gender differences are similarly small in the early stage of the life cycle, and they grow with the presence of children under three: women work at home around 20 hours more then men at that stage. In France the gender gap remains ample until the phase of the "empty nest", while in the US it decreases soon as children grows up.

The results of Tobit models for the time spent in unpaid work confirm our preceding comments (table 7): the life cycle affects the involvement in unpaid work of men and women in most cases, even once we control for education (that could shape attitudes and gender roles), the day of the week, town size for all four countries and for some additional specific covariates available not in all countries such as predicted wage, non labour income and citizenship in France, ethnicity in US, geographical area in Italy and US, housing characteristics and the presence of household paid services in Italy and in France.

Model results also confirm that women's time in unpaid work is much more influenced by the life course typologies (all the marginal effect are statistically significants and larger in magnitude) than the men's time (table 7).

With respect to the reference category (being in couple without children) we notice that the singles living with parents are those who do the less at home and the reductive effect is particularly strong for women in France and in Italy. When one leaves parental home, the domestic time increases in all the countries. But, let us underline that both single men and those in couple participate to domestic chores in a similar amount in Sweden and in France (parameter not significantly different) and in Italy (small marginal effect), whereas for women, the fact of being in

couple means in all countries a heavier burden in terms of unpaid work. Women living alone spend less time in domestic activities then those in couple, but in this case the differences are statistically significant everywhere and the marginal effect is not negligible, especially in Italy and in the US (table 7).

The greatest "revolution" in the time that individual spend in unpaid work is represented by the presence of children, especially the youngest (under 6 years old). When they become mothers, Italian women are those who increase more (in absolute terms) their domestic time (more than 22 hours per week) followed by American women (more than 18 hours on average per week), other things being equal (table 7). French and Swedish women increased it of about 16 hours. As children's age grows women reduce the time devoted to unpaid work, but when children are teenagers or young adults (16-25) they still spend in unpaid work from 5 hours a week (in Sweden) to 13 (in Italy) more than women in couple without children.

Young fathers involvement is more heterogeneous across countries, since Swedish fathers are the only ones who increase the amount of hours spent in domestic tasks and care considerably with respect to the reference category when they have children under three (more than 10 hours a week) and who also maintain their involvement as children grow up (around 6 hours). Conversely, their Italian or French homologues show a less relevant change when children are younger (around 6 hours), and even a minor one as the mean age of children grows. US fathers are in an intermediate position.

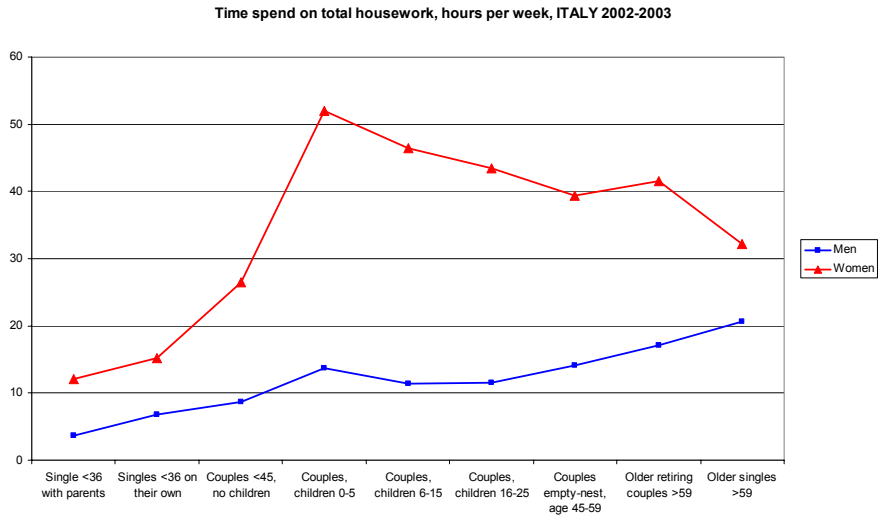
For the fathers with teenagers, things are really different across countries (table 7). Italian, French and American men with children aged 16 to 25 increase their involvement of less than 2 hours a week with respect to men in couple without children, whereas Swedish parents still spend longer time on domestic chores than men without children (more than 5 hours per week).

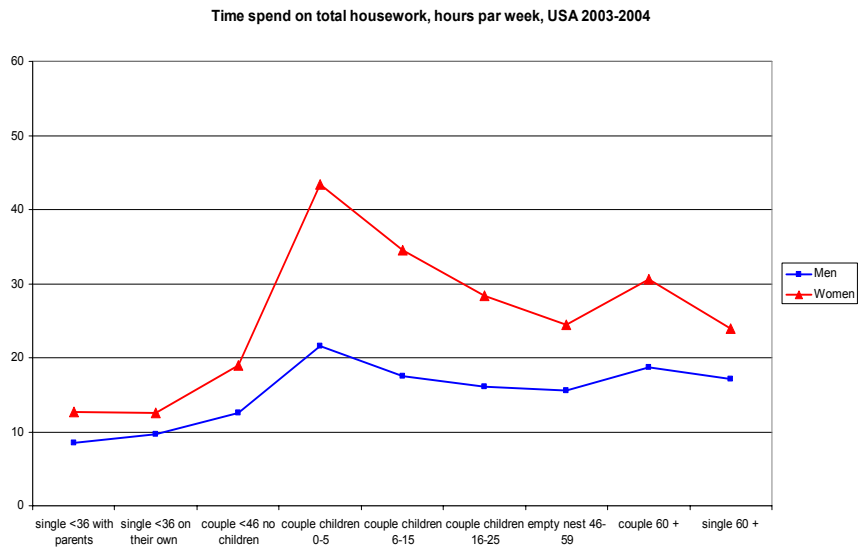
In any countries, both men and women in an "empty nest" family work more hours than those living in a younger childless couple, *ceteris paribus* (table 7). This effect could also derive from the cohort bias of our analysis in terms of life-cycle. When children have left parental home, the quantity of unpaid work decreases a little for "empty-nest" women with respect to mothers of teenagers in Italy, France and Sweden; a more consistent reduction is observed in the US. For men, those in an empty nest family slightly reduce their time in unpaid work with respect to fathers of teenagers only in Sweden; conversely they increase it both in Italy and in France; in the US the coefficient is not significantly different from 0.

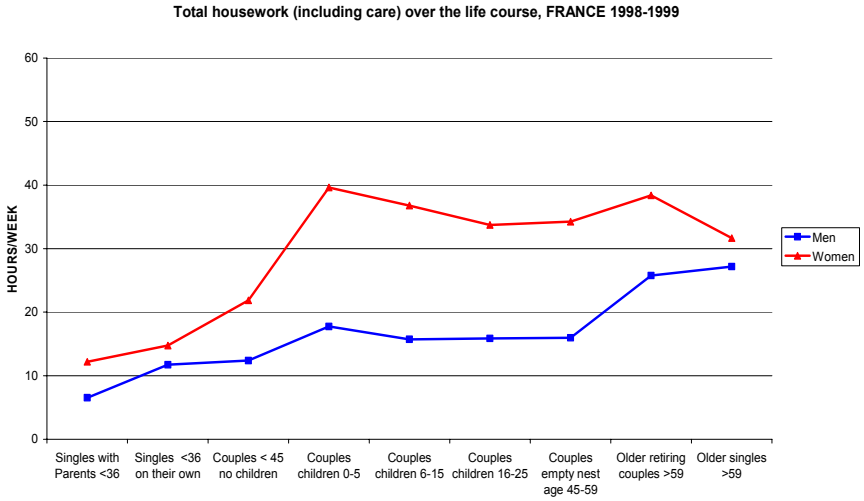
Retirement seems to facilitate men to intensify their participation in unpaid work with respect to the younger ones in an empty nest couple everywhere, while female participation decreases only in France (table 7). In Italy it increases only slightly, while in Sweden and especially in the US the intensification is more consistent. In these last two countries, where female labour participation was ample also for the older female cohorts, is possible that retirement affect both men and women's time use in a similar way.

Lastly, widowhood has reverse effects on participation for men an women (table 7): it increases strongly the male one and diminishes women's one comparing to the same age persons in couple. Of course, being single reduces the need of total housework and this result beneficial for widows. Conversely, the widowers are obliged to do the domestic tasks usually performed by his former wife. The effect seems to be particularly strong in Italy and in France. In the US widows reduce their involvement in unpaid work also with respect to the reference category.

Figure 3: Time spend on total unpaid work, hours per week







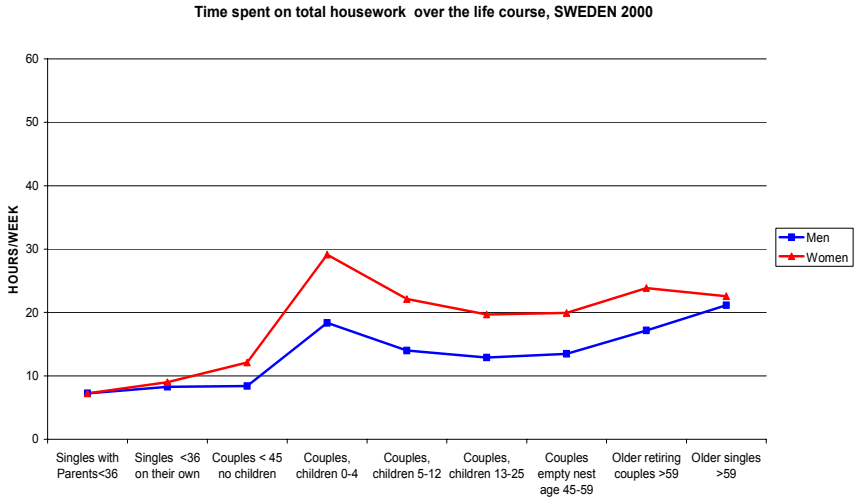


Table 7: Marginal effects from Tobit model for total housework time (evaluated at sample mean, bootstrap) by country and gender

	FRANCE				ITALY				SWEDEN				US			
	Men		Women		Men		Women		Men		Women		Men		Women	
	dy/dx	P>|z|	dy/dx	P>|z|	dy/dx	P>|z|	dy/dx	P>|z|	dy/dx	P>|z|	dy/dx	P>|z|	dy/dx	P>|z|	dy/dx	P>|z|
Household life-course typologies (ref.: couple <46 no children)																
Single <36 with parents	-10.63	0.000	-17.63	0.000	-7.71	0.000	-16.39	0.000	-2.77	0.111	-5.79	0.000	-6.70	0.000	-11.18	0.000
Single <36 on their own	-0.03	0.982	-5.36	0.000	-2.73	0.000	-10.10	0.000	-1.27	0.106	-3.04	0.000	-4.19	0.000	-9.50	0.000
Couple children 0-5	5.53	0.000	16.04	0.000	6.15	0.000	22.67	0.000	10.42	0.000	15.93	0.000	7.43	0.000	18.19	0.000
Couple children 6-15	3.14	0.000	11.78	0.000	2.63	0.000	16.19	0.000	6.04	0.000	9.38	0.000	3.77	0.000	10.17	0.000
Couple children 16-25	1.71	0.050	9.59	0.000	1.31	0.001	13.17	0.000	5.46	0.000	7.59	0.000	1.03	0.154	4.74	0.000
Empty nest 46-59	2.85	0.015	8.72	0.000	2.69	0.000	10.27	0.000	5.12	0.000	7.47	0.000	0.40	0.493	1.44	0.014
Couple 60 +	6.65	0.000	7.26	0.000	4.36	0.000	10.45	0.000	6.88	0.000	9.94	0.000	1.41	0.011	4.04	0.000
Single 60 +	7.91	0.000	2.20	0.028	9.30	0.000	1.38	0.039	9.41	0.000	7.55	0.000	1.75	0.003	-1.55	0.004
Other characteristics																
Predicted wage	0.00	0.000	0.00	0.000												
Non labour income	0.00	0.008	0.00	0.018												
….Income (elasticity)									-0.04	0.163	0.01	0.488				
Low income/ec. sit. (ref.: med.)					-3.40	0.000	-1.45	0.191					-3.43	0.001	2.42	0.016
High income/ec. sit. (ref.: med.)					0.50	0.028	1.94	0.000					-0.04	0.904	-0.74	0.071
Low education (ref.: medium)	-0.38	0.456	0.66	0.286	-0.70	0.003	3.31	0.000	-0.30	0.674	0.23	0.754	-1.93	0.003	-0.02	0.982
High education (ref.: medium)	0.77	0.141	0.31	0.649	0.33	0.284	-1.67	0.000	0.19	0.641	0.96	0.094	0.77	0.020	-0.43	0.244
French citizenship	1.63	0.094	-1.38	0.214												
Hispanic (ref.: White non Hisp.)													-1.88	0.001	0.16	0.766
Black (ref.: White non Hispanic)													-3.53	0.000	-5.04	0.000
Others (ref.: White non Hispanic)													-1.51	0.011	0.60	0.471
Living in big city	-0.02	0.964	-0.74	0.186	0.11	0.631	-0.65	0.038	-3.17	0.000	-2.04	0.000	-0.40	0.193	0.04	0.883
Household paid services	-0.04	0.955	-4.36	0.000	-0.09	0.004	-0.33	0.000								
Ownership of house					1.02	0.000	-0.33	0.380								
House dwellers	2.47	0.000	0.35	0.655												
Number of room in house or flat	-0.04	0.853	0.87	0.000	0.12	0.122	0.08	0.430								
Garden	1.95	0.002	2.28	0.001	1.37	0.000	0.66	0.026								
Centre (ref.: North)					-0.67	0.009	1.89	0.000								
South (ref.: North)					-2.69	0.000	4.22	0.000								
Midwest (ref.: North East)													-0.04	0.922	-0.92	0.038
South (ref.: North East)													-0.38	0.348	-1.79	0.000
West (ref.: North East)													0.45	0.352	-1.07	0.030
Saturday (ref.: Mon-Fri)	6.88	0.000	4.08	0.000	3.77	0.000	2.34	0.000	4.22	0.000	3.14	0.000	6.71	0.000	4.80	0.000
Sunday (ref.: Mon-Fri)	0.26	0.687	-2.48	0.000	0.03	0.895	-5.40	0.000	3.70	0.000	1.54	0.021	5.17	0.000	0.31	0.415
Expected value	16.7		31.9		11.5		34.4		15.2		21.3		18.4		28.3	
Number of obs.	4,768			5,069	16,187		17,096		2,893		3,329		12,555		16,268	
Censored obs.	887			150	4,814		914		363		112		1,978		887	
Log likelihood	-17444		-20755		-52224		-70361		-10749		-13237		-49209		-69937	
Prob. > chi2	0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
Pseudo R2	0.029		0.047		0.028		0.057		0.017		0.022		0.010		0.017	

7. Time spent on leisure over the life-cycle

The trend of time spent on leisure time over the life-cycle is very similar across countries, being lower for parents of young children. The levels are also relatively similar belonging a bracket between a minimum of 25 hours a week 60 hours for retired people, except in Italy where mean level is lower about 10 hours per week. Although we can notice that leisure time is everywhere higher for men than for women, the gap is stronger in Italy and very weak in Sweden, reflecting different gender-role set, as we have seen for time spent in paid and unpaid work.

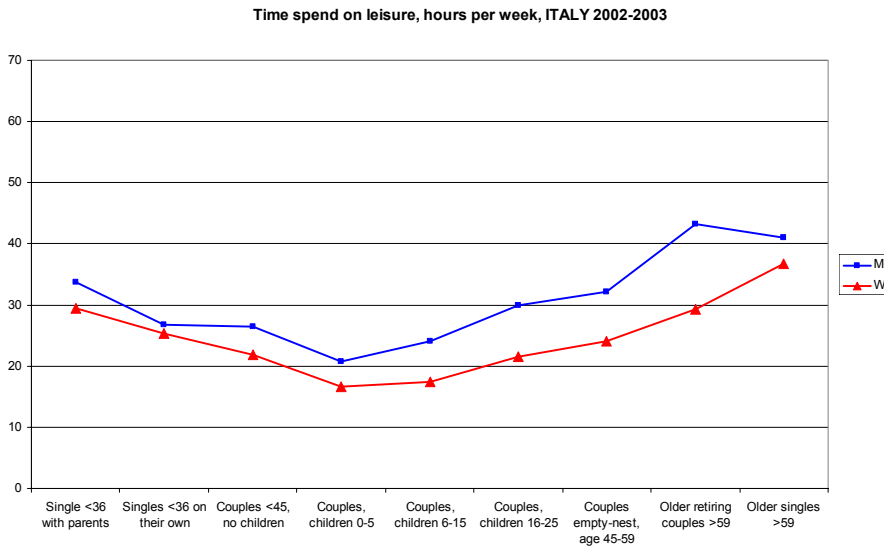
Leisure follows a quite comparable evolution along the life cycle, following a u-curve with high level of leisure at the first and last steps of life. However, we can observe some discrepancies by gender across countries.

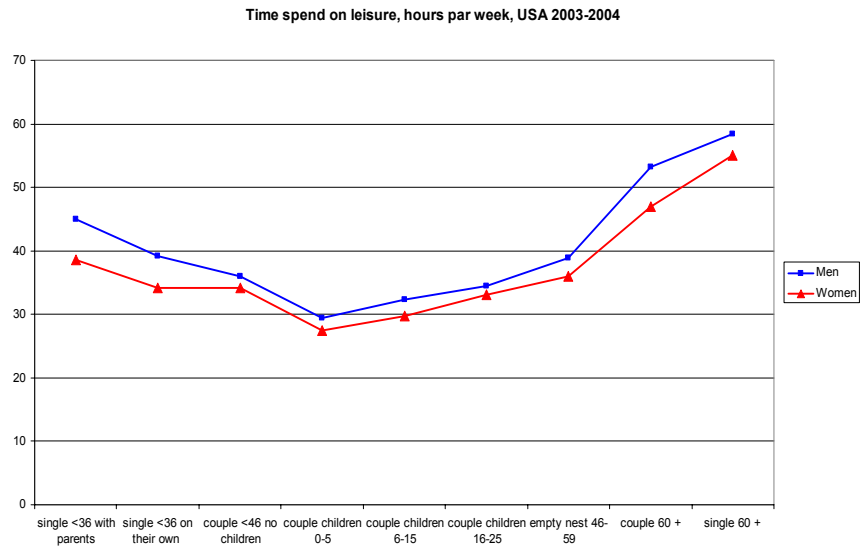
Singles living with their parents have a great amount of leisure time. Except Swedish girls (who maybe share a part of domestic chores), young men and women are those who benefit the more from the parental home in terms of leisure. When they quit their parents, Swedish boys and girls are the only ones to increase their leisure time, whereas others are reducing leisure since unpaid work has increased. Coefficient are particuraly significant for women since the reference population are the individuals living in couple without children. French and Italian women on their own have higher leisure time than women living in couple, it is not true for American. There are not difference for men: living in a couple allows French, US and Italian men to maintain their leisure level, the opposite occurs to women.

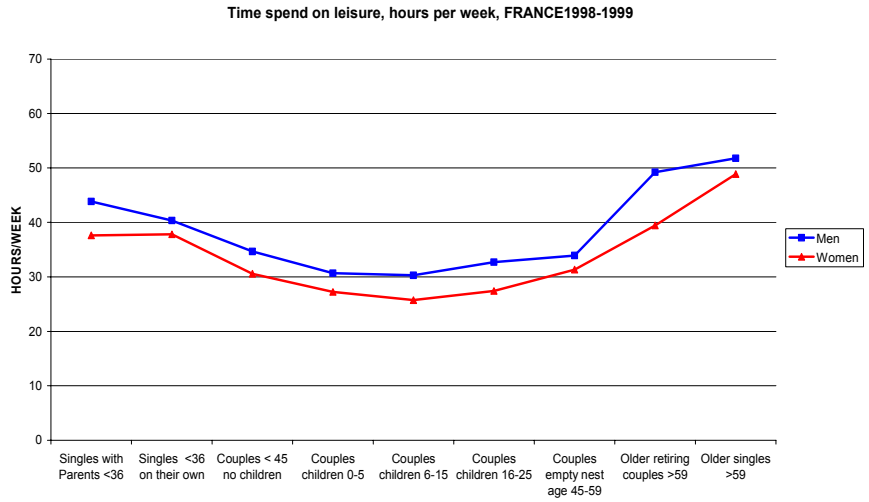
The negative impact of having pre-school children on leisure is universal (significant in the four countries) and stronger for women. When children grow up, between 6 and 15 years old, the penalty on leisure disappears for French and Italian men, but not for Swedish and US fathers, which shows the stronger implication of fathers in parental tasks. Later, with teenagers, the penalty is still visible for Swedish and US women, whereas a leisure gain is noticable for Italian fathers. The impact of children on leisure is more persistant in Sweden and United States.

When the children leave the parental home and later, the gender gap is still there: men's leisure time is always higher than women's. For couples over 60, the gender differences are really large: men spend in leisure a number of hours more than double than women in France, Italy and Sweden. Women have to wait their widowhood to overtake the male leisure amount in France and Italy. In the United States, leisure seems to be more equally shared between sexes. The amounts are similar between spouses of over 60 years old or between widows and widowers.

Figure 6: Time spend on leisure, hours per week







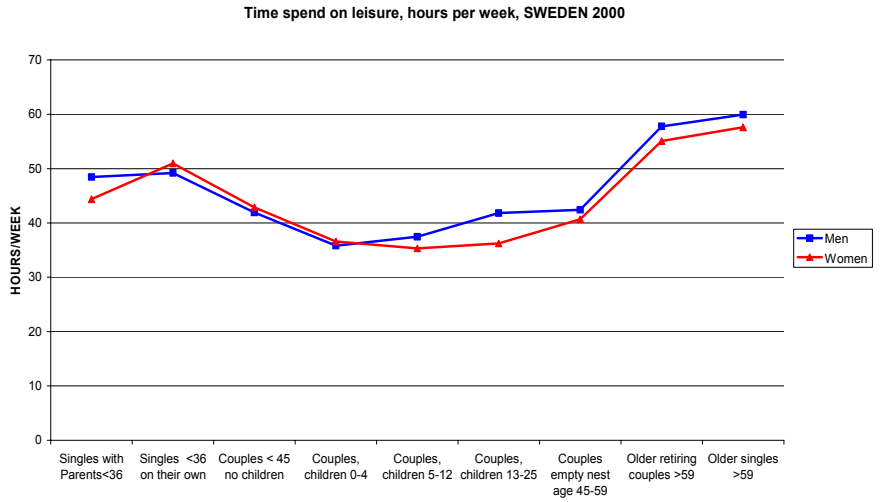


Table 8: Marginal effects from OLS regression model for leisure time, by country and gender

	FRANCE				ITALY				SWEDEN				US			
	Men		Women		Men		Women		Men		Women		Men		Women	
	Coeff.	P>|z|	Coeff.	P>|z|	Coeff.	P>|z|	Coeff.	P>|z|	Coeff.	P>|z|	Coeff.	P>|z|	Coeff.	P>|z|	Coeff.	P>|z|
Constant	35.13	0.000	33.31	0.000	26.49	0.000	22.86	0.000	36.53	0.000	40.59	0.000	35.81	0.000	32.95	0.000
Household life-course typologies (ref.: couple <46 no children)																
Single <36 with parents	5.93	0.000	4.18	0.004	7.43	0.000	8.26	0.000	6.91	0.038	1.64	0.580	3.44	0.001	4.68	0.000
Single <36 on their own	1.70	0.299	3.92	0.018	1.60	0.117	2.71	0.004	8.33	0.000	6.97	0.000	0.35	0.717	-0.69	0.507
Couple children 0-5	-3.51	0.004	-5.13	0.000	-4.43	0.000	-5.83	0.000	-5.19	0.000	-7.12	0.000	-7.20	0.000	-11.20	0.000
Couple children 6-15	-1.77	0.139	-5.00	0.000	-0.43	0.523	-3.83	0.000	-4.16	0.013	-7.48	0.000	-4.23	0.000	-7.40	0.000
Couple children 16-25	1.97	0.140	-1.93	0.108	4.26	0.000	-0.40	0.461	0.90	0.656	-5.83	0.000	-0.81	0.306	-3.52	0.000
Empty nest 46-59	2.59	0.061	0.51	0.672	5.84	0.000	1.68	0.012	1.71	0.288	-2.11	0.096	2.51	0.000	0.24	0.786
Couple 60 +	10.02	0.000	5.07	0.000	15.11	0.000	6.47	0.000	14.17	0.000	8.58	0.000	11.37	0.000	12.25	0.000
Single 60 +	10.77	0.000	12.87	0.000	11.37	0.000	11.89	0.000	18.04	0.000	11.86	0.000	16.10	0.000	15.04	0.000
Other characteristics																
Predicted wage	0.00	0.000	0.00	0.000												
Non labour income	0.00	0.001	0.00	0.000												
….Income (elasticity)									-0.54	0.003	-0.032	0.021				
Low income/ec. sit. (ref.: med.)					0.47	0.633	0.65	0.395					2.79	0.000	3.56	0.000
High income/ec. sit. (ref.: med.)					0.65	0.068	-0.32	0.234					-1.58	0.000	-2.12	0.000
Low education (ref.: medium)	-0.19	0.790	-0.88	0.133	-1.97	0.000	-1.06	0.000	1.62	0.115	1.14	0.228	0.90	0.311	1.67	0.124
High education (ref.: medium)	3.14	0.000	1.50	0.020	-0.64	0.257	0.72	0.112	0.65	0.492	-1.35	0.074	-1.95	0.000	-2.16	0.000
French citizenship	-0.15	0.908	0.62	0.591												
Hispanic (ref.: White non Hisp.)													-4.34	0.000	-2.42	0.002
Black (ref.: White non Hispanic)													1.54	0.014	7.01	0.000
Others (ref.: White non Hispanic)													-2.45	0.004	0.90	0.374
Living in big city	-0.79	0.198	-0.33	0.522	1.18	0.000	1.48	0.000	3.82	0.000	1.51	0.046	0.57	0.123	0.33	0.482
Household paid services	-0.28	0.797	2.18	0.019	-0.05	0.240	0.09	0.008								
House dwellers	-4.37	0.000	-2.08	0.010												
Number of room in house or flat	0.43	0.086	-0.22	0.300	-0.22	0.027	-0.10	0.181								
Garden	-0.21	0.826	-0.78	0.308	-1.85	0.000	-0.68	0.009								
Ownership of house					0.13	0.708	-0.57	0.041								
Centre (ref.: North)					-2.13	0.000	-2.64	0.000								
South (ref.: North)					-1.68	0.000	-1.56	0.000								
Midwest (ref.: North East)													-0.28	0.593	0.10	0.871
South (ref.: North East)													-0.06	0.910	0.24	0.694
West (ref.: North East)													-1.03	0.058	0.01	0.987
Saturday (ref.: Mon-Fri)	14.74	0.000	7.64	0.000	7.96	0.000	3.03	0.000	17.60	0.000	13.17	0.000	9.62	0.000	15.30	0.000
Sunday (ref.: Mon-Fri)	22.87	0.000	15.10	0.000	15.79	0.000	8.87	0.000	13.38	0.000	10.31	0.000	13.37	0.000	17.79	0.000
Model																
Number of obs.	4,768		5,069		16,187		17,096		2,893		3,329		16,268		12,555	
R-squared	0.306		0.281		0.187		0.185		0.223		0.188		0.175		0.206	

8. Conclusion

The aim of this paper is to show gender differences in the allocation of time to market work, domestic work and leisure, simulating various stages of life-cycle in three European Countries – namely Italy, France and Sweden– and the United States. They represent different institutional contexts and diverge significantly in terms of welfare regimes, employment policy, family policy and social norms. The idea is that dissimilar context may influence the degree of involvement in various activities of men and women, and shape gender differences across countries.

We distinguish nine life-cycle stages according to age and family structure, which describe the major life events and stages of life of most individuals, such as exiting the family of origin, union formation, childbearing, and retiring. Our results evidence that gender differences are present everywhere, but with different degrees, depending on the welfare regime, family and employment policies, the tax system as well as social norms.

A first effect of different context is given on market participation and on the amount of time devoted to market work. For men, profiles of participation to market work or working time over the life-cycle are quite close among countries, except for older men. For women, the decrease in both participation and working time begins with the couple formation in Italy and the USA, and continues with arrival of child. In France and Sweden, the fall coincides with the presence of pre-school children. In countries where the reconcilition policies are more effective and traditionally well-estabilished (Sweden and France), the major effect of having young children is the female reduction of time devoted to paid work. Conversely in the US - where family policies are absent - or where public care services are still poor (in Italy), we notice that large proportion of women abandon the labour market. Italy is the sole country where the participation rate does not re-increase when children become older, while in the US the opposite is true, thanks to easier entry conditions. In all countries, the reduction of working hours for working mothers, strongest around the period with very young children still exists afterwords.

The gap between men and women's participation in domestic chores and care activities exists in all countries at any stage of the life course. It is usually less remarkable at the extreme phases of the life cycle: among the very young, not in couple, and at older ages, especially among singles.

Also for unpaid work, different contexts seem to shape gender roles in different ways. In France and in Italy –characterised by more traditional gender role-set– the gender gap increases with union formation, in the other countries only with the presence of children. Women's time in unpaid work is much more influenced by the life course typologies, but more in Italy and less in Sweden. Sweden is the only country where the profiles of men and women's time in unpaid work are very similar, thanks to the active gender policies adopted in that country.

The trend of time spent on leisure time over the life-cycle is very similar across countries, being lower for parents of young children. Although we can notice the everywhere leisure time is higher for men than for women. The gap is stronger in Italy and very weak in Sweden, reflecting different gender-role set, as we have seen for time spent in paid and unpaid work.

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Statistical appendix

Table A1: Household life-course typologies in the country surveys sample

FRANCE	Total		Men		Women	
Household life-course typologies	**N**	**% weighted**	**N**	**% weighted**	**N**	**% weighted**
Single <36 with parents	1,027	9.0	551	10.3	476	7.8
Single <36 on their own	411	4.3	218	4.7	193	3.9
Couple <46 no children	752	6.9	358	7.0	394	6.8
Couple children 0-5	1,078	7.6	540	7.8	538	7.3
Couple children 6-15	2,085	15.8	1,030	16.4	1,055	15.3
Couple children 16-25	1,383	11.1	691	11.6	692	10.5
Empty nest 46-59	1,042	7.4	467	7.1	575	7.7
Couple 60 +	1,851	13.8	963	14.8	888	12.8
Single 60 +	749	6.1	182	3.2	567	8.8
Total excluded	2,064	18.2	903	17.1	1,161	19.2
monoparental families	676	5.8	199	3.7	477	7.8
single 36-59	518	4.6	274	5.3	244	3.9
other excluded	870	7.8	430	8.1	440	7.5
Total	12,442	100.0	5,903	100.0	6,539	100.0

ITALY	Total		Men		Women	
Household life-course typologies	**N**	**% weighted**	**N**	**% weighted**	**N**	**% weighted**
Single <36 with parents	7,130	16.8	3,845	19.3	3,285	14.5
Single <36 on their own	875	2.2	510	2.8	365	1.7
Couple <46 no children	1,803	4.7	855	4.6	948	4.7
Couple children 0-5	3,196	8.1	1,598	8.4	1,598	7.8
Couple children 6-15	5,418	12.2	2,696	12.6	2,722	11.8
Couple children 16-25	5,754	13.1	2,859	13.6	2,895	12.7
Empty nest 46-59	1,668	3.7	686	3.2	982	4.2
Couple 60 +	4,801	12.0	2,487	12.8	2,314	11.3
Single 60 +	2,645	6.86	652	3.31	1,993	10.13
Total excluded	8,150	20.3	3,666	19.3	4,,484	21.2
monoparental families	2,107	5.3	531	2.8	1576	7.5
single 36-59	1,512	3.8	850	4.6	662	3.1
other excluded	4,531	11.2	2,285	11.9	2,246	10.7
Total	41,440	100.0	19,854	100.0	21,586	100.0

(Table A1 continued)

SWEDEN	Total		Men		Women	
Household life-course typologies	**N**	**% weighted**	**N**	**% weighted**	**N**	**% weighted**
Single <36 with parents	105	1.7	52	1.9	53	1.5
Single <36 on their own	594	9.4	362	12.8	232	6.3
Couple <46 no children	729	9.3	315	9.3	414	9.4
Couple children 0-5	1,245	15.2	559	15.4	686	15.0
Couple children 6-15	754	8.9	312	9.0	442	8.9
Couple children 16-25	431	5.2	182	5.2	249	5.2
Empty nest 46-59	1,187	15.5	527	14.3	660	16.7
Couple 60 +	805	15.1	409	15.6	396	14.7
Single 60 +	372	7.8	175	5.4	197	10.1
Total excluded	1,050	11.7	317	11.3	733	12.3
monoparental families	593	4.4	94	3.5	499	5.4
single 36-59	457	7.3	223	7.8	234	6.9
other excluded						
Total	7,272	100.0	3,210	100.0	4,062	100.0

UNITED STATES	Total		Men		Women	
Household life-course typologies	**N**	**% weighted**	**N**	**% weighted**	**N**	**% weighted**
Single <36 with parents	1,479	8.8	813	10.7	666	7.2
Single <36 on their own	1,453	5.4	831	6.9	622	4.0
Couple <46 no children	1,936	8.3	896	8.7	1,040	7.9
Couple children 0-5	3,681	9.5	1,755	9.9	1,926	9.2
Couple children 6-15	5,595	14.3	2,578	14.7	3,017	13.9
Couple children 16-25	1,773	7.7	848	8.1	925	7.2
Empty nest 46-59	2,859	9.2	1,267	9.0	1,592	9.3
Couple 60 +	3,745	11.9	1,979	13.3	1,766	10.7
Single 60 +	3,451	7.2	916	4.4	2,535	9.7
Total excluded	7,105	17.8	2,454	14.5	4,651	21.0
monoparental families	2,735	5.9	469	2.2	2,266	9.2
single 36-59	3,336	8.1	1650	9.5	1,686	6.9
other excluded	1,034	3.9	335	2.8	699	4.9
Total	33,077	100.0	14,337	100.0	18,740	100

Table A2: Descriptive statistics by country

FRANCE	Men				Women			
	Mean	St Dev	Min	Max	Mean	St Dev	Min	Max
Background characteristics								
Age in years	44.9	17.1	18	80	46.0	17.6	18	80
Married or cohabiting	0.7	0.5	0	1	0.6	0.5	0	1
Num. resident children under 18	1.1	1.3	0	10	1.0	1.2	0	10
Living in big city more than 100,000	0.4	0.5	0	1	0.5	0.5	0	1
French citizenship	1.0	0.2	0	1	1.0	0.2	0	1
Low education	0.3	0.5	0	1	0.4	0.5	0	1
Median education	0.4	0.5	0	1	0.3	0.5	0	1
High education	0.3	0.5	0	1	0.3	0.4	0	1
Gainful employed	0.6	0.5	0	1	0.4	0.5	0	1
Out of labour force=1	0.3	0.5	0	1	0.5	0.5	0	1
Equalized hh income FrFranc/month	9408	6033	1500	60000	9038	5688	1500	60000
Monthly non labour income	2236	3997	0	60000	4095	4484	0	60000
Monthly wage, predicted	6690	7334	0	85200	3270	4678	0	40000
Time use: hours per week								
Market work	26.6	31.5	0	122.5	15.0	24.9	0	119
Housework	14.6	15.9	0	82.83	27.6	17.0	0	91
Care	2.0	4.9	0	78.17	3.9	7.4	0	71.17
Total unpaid work	16.5	16.9	0	88.67	31.5	18.8	0	94.5
Total work (paid and unpaid)	43.1	27.7	0	122.5	46.5	22.9	0	121.3
Leisure	38.0	22.9	0	123.7	33.66	19.3	0	106.2
Participating in activity the day of interview (in share)								
Market work	0.48	0.5	0	1	0.31	0.46	0	1
Housework	0.77	0.43	0	1	0.96	0.19	0	1
Care	0.26	0.44	0	1	0.38	0.48	0	1
Total unpaid work	0.81	0.4	0	1	0.97	0.18	0	1
Total work (paid and unpaid)	0.94	0.23	0	1	0.99	0.12	0	1
Leisure	0.98	0.13	0	1	0.98	0.14	0	1
Other variables								
Household paid services	0.07	0.27	0	1	0.08	0.27	0	1
House dwellers	0.66	0.48	0	1	0.64	0.48	0	1
Number of room in house or flat	4.2	1.5	0	1	4.1	1.5	0	1
Have access to a garden	0.66	0.48	0	1	0.64	0.48	0	1
Sample size	**4,768**				**5,069**			

(Table A2 continued)

ITALY	Men				Women			
	Mean	St Dev	Min	Max	Mean	St Dev	Min	Max
Background characteristics								
Age in years	46.2	16.7	18	80	47.5	17.3	18	80
Married	0.6	0.5	0	1	0.6	0.5	0	1
Num. resident children under 18	0.4	0.8	0	7	0.4	0.8	0	7
Living in big city more than 50,000	0.4	0.5	0	1	0.4	0.5	0	1
Low education	0.6	0.5	0	1	0.6	0.5	0	1
Median education	0.3	0.5	0	1	0.3	0.5	0	1
High education	0.1	0.3	0	1	0.1	0.3	0	1
Gainful employed	0.6	0.5	0	1	0.4	0.5	0	1
Out of labour force	0.3	0.5	0	1	0.6	0.5	0	1
Time use: hours per week								
Market work	20.0	28.6	0	144.7	8.7	19.6	0	143.5
Housework	10.3	13.6	0	91.0	32.1	19.6	0	133.0
Care	2.0	6.0	0	78.2	4.0	8.9	0	94.5
Total unpaid work	11.8	14.6	0	91.0	35.4	21.4	0	133.0
Total work (paid and unpaid)	31.8	27.6	0	144.7	44.0	23.4	0	149.3
Leisure	36.1	20.9	0	123.7	27.2	16.5	0	136.5
Participating in activity the day of interview (in share)								
Market work	0.38	0.49	0	1	0.19	0.40	0	1
Housework	0.67	0.48	0	1	0.95	0.22	0	1
Care	0.25	0.44	0	1	0.37	0.49	0	1
Total unpaid work	0.71	0.46	0	1	0.95	0.22	0	1
Total work (paid and unpaid)	0.86	0.35	0	1	0.97	0.18	0	1
Leisure	0.98	0.15	0	1	0.97	0.17	0	1
Other variables								
Low economic situation	0.02	0.15	0	0.02	0.15	0	1	0.02
Medium economic situation	0.73	0.45	0	0.72	0.45	0	1	0.72
High economic situation	0.24	0.43	0	0.26	0.44	0	1	0.26
Household paid services	0.59	3.74	0	90	0.63	4.17	0	129
Ownership of house	0.75	0.44	0	1	0.74	0.44	0	1
Number of room in house or flat	4.55	1.63	1	20	4.52	1.68	1	20
Garden	0.64	0.48	0	1	0.63	0.49	0	1
North	0.46	0.50	0	1	0.45	0.50	0	1
Centre	0.19	0.39	0	1	0.19	0.40	0	1
South	0.36	0.48	0	1	0.35	0.48	0	1
Sample size	**19,853**				**21,575**			

(Table A2 continued)

SWEDEN	Men				Women			
	Mean	St Dev	Min	Max	Mean	St Dev	Min	Max
Background characteristics								
Age in years	45.9	16.8	20	80	47.6	16.6	20	80
Married or cohabiting	0.8	0.4	0	1	0.8	0.4	0	1
Num. resident children under 18	0.7	1.1	0	6	0.6	1.0	0	6
Living in urban areas	0.7	0.5	0	1	0.7	0.4	0	1
Low education	0.3	0.5	0	1	0.3	0.4	0	1
Median education	0.5	0.5	0	1	0.5	0.5	0	1
High education	0.3	0.5	0	1	0.3	0.4	0	1
Gainful employed	0.7	0.5	0	1	0.6	0.5	0	1
Out of labour force=1	0.3	0.5	0	1	0.4	0.5	0	1
Equalized hh income SEK/month	15857	9097	0	95400	15415	9035	1000	141846
Monthly non labour income	20967	13002	0	126100	14385	7983	0	99999
Time use: hours per week								
Market work	26.9	32.4	0	168.0	17.2	25.6	0	143.5
Housework	12.5	13.6	0	94.5	17.6	13.0	0	108.5
Care	1.6	4.5	0	70.0	3.3	7.3	0	75.8
Total unpaid work	14.1	14.3	0	94.5	20.9	14.8	0	134.2
Total work (paid and unpaid)	40.9	29.6	0	168.0	38.1	24.0	0	143.5
Leisure	45.6	24.3	0	131.8	44.6	20.9	0	126.0
Participating in activity the day of interview (in share)								
Market work	0.49	0.52	0	1	0.35	0.47	0	1
Housework	0.85	0.37	0	1	0.96	0.2	0	1
Care	0.21	0.42	0	1	0.31	0.46	0	1
Total unpaid work	0.87	0.35	0	1	0.97	0.18	0	1
Total work (paid and unpaid)	0.96	0.21	0	1	0.98	0.12	0	1
Leisure	0.99	0.11	0	1	1	0.06	0	1
Sample size	**2,893**				**3,329**			

(Table A2 continued)

UNITED STATES	Men				Women			
	Mean	St Dev	Min	Max	Mean	St Dev	Min	Max
Background characteristics								
Age in years	44.8	17.4	18	80	46.2	16.6	18	80
Married or cohabiting	0.7	0.5	0	1	0.6	0.5	0	1
Num. resident children under 18	0.7	1.1	0	10	0.8	1.1	0	11
Living in large city	0.6	0.5	0	1	0.6	0.5	0	1
White non Hispanic	0.7	0.5	0	1	0.7	0.4	0	1
Hispanic	0.1	0.3	0	1	0.1	0.3	0	1
Black	0.1	0.3	0	1	0.1	0.3	0	1
Others	0.1	0.2	0	1	0.1	0.2	0	1
Low education	0.1	0.3	0	1	0.1	0.2	0	1
Median education	0.4	0.5	0	1	0.4	0.5	0	1
High education	0.5	0.5	0	1	0.5	0.5	0	1
Gainful employed	0.7	0.5	0	1	0.6	0.5	0	1
Equalized hh income US$/month 10 000	3.6	2.8	0.1	25	3.3	2.5	0.1	25
Time use: hours per week								
Market work	30.2	33.6	0	166.8	19.7	26.3	0	162.8
Housework	11.6	16.3	0	149.3	19.7	17.2	0	125.4
Care	3.8	9.5	0	124.3	6.9	11.9	0	149.3
Total unpaid work	15.4	18.9	0	150.0	26.7	21.1	0	149.3
Total work (paid and unpaid)	45.6	31.7	0	166.8	46.3	25.8	0	163.3
Leisure	40.5	27.4	0	162.8	37.3	22.3	0	163.3
Participating in activity the day of interview (in share)								
Market work	0.54	0.52	0	1	0.40	0.46	0	1
Housework	0.74	0.46	0	1	0.91	0.28	0	1
Care	0.40	0.51	0	1	0.54	0.47	0	1
Total unpaid work	0.82	0.40	0	1	0.94	0.23	0	1
Total work (paid and unpaid)	0.93	0.26	0	1	0.97	0.16	0	1
Leisure	0.97	0.17	0	1	0.97	0.15	0	1
Other variables								
North East	0.2	0.4	0	1	0.2	0.4	0	1
Midwest	0.3	0.5	0	1	0.3	0.4	0	1
South	0.3	0.5	0	1	0.4	0.5	0	1
West	0.2	0.4	0	1	0.2	0.4	0	1
Sample size	**14,337**				**18,740**			

Table A3: Detailed marginal effects from Heckman model for market work time: (evaluated at sample mean), by country and gender

FRANCE	MEN						WOMEN					
	Total effect		Conditional effect		Effect on participation		Total effect		Conditional effect		Effect on participation	
	dy/dx	P>|z|	dy/dx	P>|z|	dy/dx	P>|z|	dy/dx	P>|z|	dy/dx	P>|z|	dy/dx	P>|z|
Household life-course typologies (ref.: couple <46 no children)												
Single <36 with parents	-4.75	0.011	-8.17	0.000	-0.03	0.414	-1.73	0.087	-5.70	0.003	-0.02	0.571
Single <36 on their own	1.09	0.661	-5.23	0.011	0.08	0.121	-1.16	0.367	-1.85	0.390	-0.02	0.502
Couple children 0-5	-1.85	0.359	-1.40	0.384	-0.03	0.480	-4.68	0.000	-4.86	0.007	-0.12	0.000
Couple children 6-15	-4.40	0.016	-1.84	0.220	-0.08	0.025	-2.62	0.002	-6.69	0.000	-0.04	0.115
Couple children 16-25	-7.15	0.000	-3.37	0.048	-0.13	0.000	-2.85	0.001	-8.54	0.000	-0.04	0.187
Empty nest 46-59	-8.70	0.000	-5.28	0.003	-0.15	0.000	-3.99	0.000	-8.58	0.000	-0.08	0.002
Couple 60 +	-26.50	0.000	-20.12	0.000	-0.50	0.000	-9.87	0.000	-16.30	0.000	-0.26	0.000
Single 60 +	-19.13	0.000	-10.25	0.099	-0.39	0.000	-9.18	0.000	-23.16	0.000	-0.23	0.000
Other characteristics												
Predicted wage	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
Non labour income	0.00	0.003	0.00	0.039	0.00	0.017	0.00	0.000	0.00	0.002	0.00	0.000
Low education (ref.: medium)	-1.75	0.160	-0.13	0.909	-0.04	0.123	-0.31	0.648	-0.09	0.939	-0.01	0.628
High education (ref.: medium)	-6.51	0.000	-4.81	0.000	-0.10	0.000	-0.14	0.840	-2.59	0.014	0.01	0.465
French citizenship	2.08	0.319	1.52	0.417	0.03	0.437	0.75	0.534	0.79	0.735	0.02	0.587
Living in big city more than 100,000	0.11	0.911	-1.37	0.091	0.01	0.436	-0.63	0.244	-1.34	0.131	-0.01	0.477
Saturday (ref.: Mon-Fri)	-20.99	0.000	-13.43	0.000	-0.40	0.000	-7.42	0.000	-9.23	0.000	-0.20	0.000
Sunday (ref.: Mon-Fri)	-23.85	0.000	-18.72	0.000	-0.47	0.000	-9.70	0.000	-17.11	0.000	-0.26	0.000
Expected value	20.0		47.5		0.42		7.4		33.9		0.22	
Model												
Number of obs.	4,768						5,069					
Censored obs.	2,457						3,437					
Wald chi2(14)	99.56						139.06					
Log likelihood	-11859						-8780					
Prob. > chi2	0.000						0.000					
Rho	-.647	0.03					-0.65	0.03				
Sigma	20.6	0.36					19.41	0.45				
Lambda	-13.35	0.81					-12.6	0.94				

(Table A3continued)

ITALY	MEN						WOMEN					
	Total effect		Conditional effect		Effect on participation		Total effect		Conditional effect		Effect on participation	
	dy/dx	P>|z|	dy/dx	P>|z|	dy/dx	P>|z|	dy/dx	P>|z|	dy/dx	P>|z|	dy/dx	P>|z|
Household life-course typologies (ref.: couple <46 no children)												
Single <36 with parents	-9.37	0.000	-1.80	0.080	-0.17	0.000	-2.55	0.000	0.95	0.396	-0.06	0.000
Single <36 on their own	-1.37	0.354	0.37	0.798	-0.03	0.273	1.42	0.116	-0.08	0.959	0.03	0.093
Couple children 0-5	2.94	0.018	1.10	0.311	0.05	0.024	-3.74	0.000	-7.71	0.000	-0.08	0.000
Couple children 6-15	0.78	0.472	-1.60	0.118	0.03	0.185	-2.21	0.000	-6.61	0.000	-0.04	0.000
Couple children 16-25	-4.18	0.000	-2.19	0.035	-0.07	0.000	-2.35	0.000	-4.63	0.000	-0.04	0.000
Empty nest 46-59	-7.95	0.000	-3.48	0.016	-0.14	0.000	-3.25	0.000	-3.91	0.012	-0.07	0.000
Couple 60 +	-21.53	0.000	-6.48	0.000	-0.41	0.000	-7.58	0.000	-9.30	0.001	-0.17	0.000
Single 60 +	-17.31	0.000	-6.16	0.014	-0.33	0.000	-7.31	0.000	-6.18	0.050	-0.17	0.000
Other characteristics												
Low education (ref.: medium)	1.36	0.008	3.20	0.000	0.01	0.538	-1.67	0.000	2.53	0.000	-0.05	0.000
High education (ref.: medium)	4.88	0.000	-2.46	0.003	0.12	0.000	3.16	0.000	-2.99	0.001	0.09	0.000
Living in big city more than 50,000	-1.48	0.002	-0.41	0.398	-0.03	0.002	-1.16	0.000	-0.53	0.391	-0.03	0.000
Centre (ref.: North)	1.13	0.088	1.13	0.085	0.01	0.215	-0.29	0.342	-0.38	0.623	-0.01	0.398
South (ref.: North)	0.65	0.207	0.14	0.789	0.01	0.201	-3.00	0.000	-1.25	0.073	-0.07	0.000
Saturday (ref.: Mon-Fri)	-14.44	0.000	-5.94	0.000	-0.25	0.000	-4.47	0.000	-2.83	0.000	-0.10	0.000
Sunday (ref.: Mon-Fri)	-25.55	0.000	-12.26	0.000	-0.45	0.000	-8.99	0.000	-6.51	0.000	-0.19	0.000
Expected value	17.1		51.1		0.34		5.3		43.3		0.12	
Model												
Number of obs.	16,187						17,096					
Censored obs.	9,910						13,798					
Log likelihood	-35273						-20649					
Prob. > chi2	0.000						0.000					
Rho	-0.531	0.01					-0.363	0.04				
Sigma	20.11	0.23					17.78	0.31				
Lambda	-10.69	0.51					-6.47	0.89				

(Table A3 continued)

SWEDEN	MEN						WOMEN					
	Total effect		Conditional effect		Effect on participation		Total effect		Conditional effect		Effect on participation	
	dy/dx	P>|z|	dy/dx	P>|z|	dy/dx	P>|z|	dy/dx	P>|z|	dy/dx	P>|z|	dy/dx	P>|z|
Household life-course typologies (ref.: couple <46 no children)												
Single <36 with parents	-10.82	0.000	0.07	0.991	-0.22	0.000	3.61	0.308	-2.02	0.643	0.10	0.177
Single <36 on their own	-7.21	0.000	-1.97	0.443	-0.14	0.000	-1.08	0.544	0.95	0.721	-0.03	0.406
Couple children 0-5	-4.16	0.025	-1.46	0.514	-0.07	0.028	-6.21	0.000	-8.18	0.000	-0.10	0.000
Couple children 6-15	-0.92	0.678	-3.97	0.109	0.01	0.782	0.28	0.852	-4.48	0.032	0.04	0.257
Couple children 16-25	-2.70	0.261	-4.00	0.169	-0.03	0.551	0.56	0.760	-1.31	0.591	0.02	0.574
Empty nest 46-59	-2.03	0.298	-2.51	0.263	-0.02	0.512	-0.57	0.674	-5.55	0.004	0.02	0.428
Couple 60 +	-18.79	0.000	-15.01	0.000	-0.35	0.000	-12.71	0.000	-10.75	0.002	-0.27	0.000
Single 60 +	-18.81	0.000	-22.64	0.000	-0.36	0.000	-12.32	0.000	-10.89	0.034	-0.26	0.000
Other characteristics												
Low education (ref.: medium)	-1.74	0.229	0.98	0.583	-0.04	0.100	-2.11	0.065	-2.13	0.250	-0.04	0.136
High education (ref.: medium)	0.97	0.458	-2.84	0.057	0.04	0.077	1.42	0.128	-4.54	0.000	0.06	0.001
Living in urban areas	-3.57	0.007	-4.70	0.001	-0.04	0.105	-1.36	0.160	0.92	0.489	-0.04	0.063
Saturday (ref.: Mon-Fri)	-22.64	0.000	-13.59	0.000	-0.42	0.000	-15.65	0.000	-10.08	0.000	-0.32	0.000
Sunday (ref.: Mon-Fri)	-23.90	0.000	-14.57	0.000	-0.44	0.000	-15.42	0.000	-9.76	0.000	-0.32	0.000
Expected value	17.6		48.6		0.36		12.2		44.4		0.27	
Model												
Number of obs.	2,893						3,329					
Censored obs.	1,716						2,240					
Log likelihood	-6749						-6438					
Prob. > chi2	0.002						0.000					
Rho	-5.532	0.04					-0.495	0.05				
Sigma	24.07	0.59					21.06	0.60				
Lambda	-12.82	1.17					.10.43	1.39				

(Table A3 continued)

UNITED STATES	MEN						WOMEN					
	Total effect		Conditional effect		Effect on participation		Total effect		Conditional effect		Effect on participation	
	dy/dx	P>|z|	dy/dx	P>|z|	dy/dx	P>|z|	dy/dx	P>|z|	dy/dx	P>|z|	dy/dx	P>|z|
Household life-course typologies (ref.: couple <46 no children)												
Single <36 with parents	-6.77	0.000	-5.43	0.000	-0.10	0.000	-3.38	0.000	-4.30	0.004	-0.05	0.002
Single <36 on their own	1.32	0.272	0.55	0.666	0.02	0.292	3.87	0.000	1.41	0.288	0.08	0.000
Couple children 0-5	4.99	0.000	0.32	0.738	0.10	0.000	-6.49	0.000	-6.58	0.000	-0.12	0.000
Couple children 6-15	5.12	0.000	0.54	0.522	0.10	0.000	-3.25	0.000	-5.42	0.000	-0.04	0.000
Couple children 16-25	4.70	0.000	2.03	0.098	0.07	0.000	-0.64	0.414	-1.53	0.200	0.00	0.772
Empty nest 46-59	0.48	0.640	-0.47	0.666	0.01	0.432	-1.75	0.004	-2.43	0.013	-0.02	0.046
Couple 60 +	-17.57	0.000	-9.21	0.000	-0.31	0.000	-12.14	0.000	-10.92	0.000	-0.25	0.000
Single 60 +	-18.05	0.000	-2.73	0.169	-0.35	0.000	-12.41	0.000	-8.14	0.000	-0.26	0.000
Other characteristics												
Low education (ref.: medium)	-3.66	0.002	-0.72	0.639	-0.07	0.001	-5.27	0.000	0.64	0.718	-0.12	0.000
High education (ref.: medium)	2.83	0.000	-3.15	0.000	0.08	0.000	3.44	0.000	-1.71	0.005	0.09	0.000
Hispanic (ref.: White non Hisp.)	0.20	0.837	1.00	0.342	0.00	0.771	0.67	0.319	2.89	0.005	0.00	0.784
Black (ref.: White non Hispanic)	-5.81	0.000	-1.43	0.188	-0.11	0.000	-1.00	0.067	1.89	0.032	-0.03	0.001
Others (ref.: White non Hispanic)	-2.51	0.031	-1.07	0.422	-0.04	0.042	0.32	0.706	-0.14	0.917	0.01	0.629
Living in big city	-0.18	0.755	-1.13	0.072	0.01	0.523	-1.06	0.006	-1.35	0.022	-0.01	0.049
Midwest (ref.: North East)	1.08	0.182	0.49	0.573	0.02	0.206	1.69	0.002	2.40	0.004	0.02	0.040
South (ref.: North East)	1.19	0.118	1.99	0.016	0.01	0.614	0.64	0.208	1.27	0.109	0.01	0.535
West (ref.: North East)	-1.11	0.184	1.71	0.063	-0.04	0.010	0.45	0.435	0.99	0.261	0.00	0.745
Saturday (ref.: Mon-Fri)	-20.71	0.000	-12.25	0.000	-0.35	0.000	-13.42	0.000	-11.81	0.000	-0.26	0.000
Sunday (ref.: Mon-Fri)	-24.83	0.000	-15.60	0.000	-0.42	0.000	-15.08	0.000	-13.85	0.000	-0.29	0.000
Expected value	21.8		50.2		0.43		12.7		44.1		0.28	
Model												
Number of obs.	14,337						18,740					
Censored obs.	7,789						12,594					
Log likelihood	-37851						-37471					
Prob. > chi2	0.000						0.000					
Rho	-0.65	0.01					-0.67	0.01				
Sigma	26.8	0.31					25.7	0.36				
Lambda	-17.57	0.58					-17.28	0.66				

Technical Appendix

Generalized Tobit (Heckman Type II), market work

Heckman's (1978) generalized tobit model (tobit type II), consists of a structural equation (preferred labor supply function), an index equation (labor participation), a threshold equation linking preferred and observed hours and finally a stochastic specification.

(1) Structural equation: $y_i^* = x_{1i}'\beta_1 + \varepsilon_i$

(2) Index equation: $d_i^* = x_{2i}'\beta_2 + \nu_i$

(3) Threshold index equation: $d_i = \begin{cases} 1 \text{ if } d_i^* > 0 \\ 0 \text{ if } d_i^* \le 0 \end{cases}$

(4) Threshold structural equation: $y_i = \begin{cases} y_i^* \text{ if } d_i = 1 \\ 0 \text{ else} \end{cases}$

(5) Stochastic specification: $\varepsilon_i, \nu_i \sim N(0,0,\sigma^2,1,\rho)$

y_i* denotes the latent (non-observed) endogenous variable, in our case the preferred hours of market work, and y_i denotes the corresponding observed variable (measured hours of work). x_{1i} and x_{2i} are vectors of explanatory variables, which are assumed to be uncorrelated with the error terms ε_i och ν_i. β_1 and β_2 are vectors of parameters. d_i^* is a latent variable that represents binary censoring and d_i is the observed value (1 if the individual reports market work, else 0).

Given the stochastic specification the likelihood function can be derived as

(6) $$L = \prod_{y=0} \Phi(-X_2\beta_2) \prod_{y>0} \left\{ \Phi\left(\frac{X_2\beta_2 + \frac{\rho}{\sigma}(y - X_1\beta_1)}{\sqrt{1-\rho^2}} \right) \frac{1}{\sigma} \phi((y - X_1\beta_1)/\sigma) \right\}$$

where y=0 denotes the individuals with zero working hours and y>0 the individuals with positive hour, Φ and ϕ denotes the univariate cdf and pdf of the standard normal. Estimation of this model is straightforward and the software Stata has been used in the present article.

Since the interpretation of the estimated coefficients are not straightforward it is necessary to calculate the marginal effects

The Expected value is equal to

$$E(y_i) = P(d_i^* > 0)\, E(y_i \mid d_i^* > 0)$$
$$= \Phi(X_{2i}'\beta_2)\left[X_{1i}'\beta_1 + \rho\sigma \frac{\phi(X_{2i}'\beta_2)}{\Phi(X_{2i}'\beta_2)} \right]$$

and the Marginal effects are

$$\frac{\partial E[y_i]}{\partial X_{1j}} = \Phi(X_2'\beta_2)\beta_{1j} + \delta\left[\phi(X_2'\beta_2)\beta_{2j}(X_1'\beta_1 - \rho\sigma X_2'\beta_2)\right]$$

where $\delta=1$ if X_{1j} is included in X_2 and else $\delta=0$

Furthermore, McDonald et Moffitt (1980) have shown that the total marginal effect could be decomposed in two distinct effects

$$(7)\quad \frac{\partial E(Y)}{\partial x_1} = \frac{\partial p(d=1)}{\partial x_1} E(y \mid d=1) + \frac{\partial E(y \mid d=1)}{\partial x_1} p(d=1)$$

The first term on the right side of the equation (7) reflects the impact of the covariate x_1 on the likelihood to participating in the labour market weighted by the expected value of working time. The second term reflect the impact of the covariate x_1 on working time for those participating weighted by the probability of being in the labour force. In other word, the first term reflects the variation of the exogeneous variable on the likelihood to work and the second term the impact on the exogeneous variable on working time given participation

The Generalised Tobit method presents therefore two advantages. First, this method is more flexible compared to a standard Tobit since it allows selecting different explanatory variables in the participation and hours' equations. Second, in contrast to a standard Tobit, the decomposition of the total marginal effect (effect on participation and effect on hours given participation) is not assumed to be constant for all exogeneous variables as in the standard Tobit.