

Use of time and value of unpaid family care work: a comparison between Italy and Poland (preliminary version)

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June 7, 2010

Abstract

The aim of the study is to provide an analysis and a comparison of the size and value of unpaid family care work (UFCW) in two European member States: Italy and Poland. These two countries are chosen for the quality of their data and because they can be taken as representative examples of an old Mediterranean member and a newly entered member respectively, both important targets for the policy maker given their differences in family policies and in their typical attitudes toward unpaid family care work. The study relies on the use of both the opportunity cost approach and the market replacement approach to measure family care work distinguishing its main components in child care and old-age care. A micro-data analysis is conducted using the Italian and Polish time use surveys. While the Polish time use survey includes data on wages, the Italian time use survey, to overcome the lack of information on wages, has been complemented with EU-SILC (the European Union Statistics on Income and Living Conditions relative to 2006 by EUROSTAT) using different matching processes. The comparison between the two countries reveals that Italians participate somewhat less than Poles in child care, but substantially more in elderly care. However, since Italy has a larger total population than Poland, the number of people performing both child and elderly care is higher. There are not significant differences in time spent in primary child care for both males and females, but Poles spend around forty per cent less than Italians in elderly care. However, the main explanation of the difference in the value of unpaid family care work, which is much higher in Italy, is to be attributed to the discrepancy in hourly wages, since average Polish wages are about one fifth of Italian wages.

JEL Classification: KEYWORDS: Time Use, Unpaid Work, Caregiving, Child care, Elderly care, Poland, Italy.

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1 Introduction

Unpaid work, beyond the obvious gender inequalities characterizing it, constitutes an integral part of any functioning economy, and as such is linked to economic growth, government policy, migration, and many development issues. There are several motives for studying unpaid work, each one connected to policy issues. We mention the four of them which are the most relevant for the present paper. First, the motive of its interrelation with labour market work, especially relevant for women. In this field, the economic literature is very rich, with different approaches. Second, the motive of measuring the contribution of unpaid work to GDP. This motive has led to the development of methods for gender budgeting with the aim of building satellites accounts to be incorporated in the System of National Accounts. Third, the motive of choosing the optimal mix of public and private resources for financing care in a welfare system. Some studies have concentrated on child care regimes in Europe, other studies on elderly care and equity and efficiency in home based care. Fourth, the motive of tracking gender inequalities, arising from the unequal sharing of domestic/family care task between women and men. The discussion about the role of UFCW has been growing substantially over the past decade at the European level. This is documented by several EC reports like those produced by the Expert Group on Gender, Social Inclusion and Employment (EGGSIE) on “Making Work Pay” (2005), the “Reconciliation of work and private life” (2005) and the Report on equality between women and men 2008 by DG Employment of the EC (2008). As for UFCW specific policy context, this can be distinguished in two types. First, specific or direct policies which are explicitly aimed at recognizing or making unpaid family care work more visible in order to influence the quantity of unpaid work done in a society and to change the distribution of unpaid work among different groups in society. Second, indirect or “mainstreamed” policies, which are not designed and implemented with a view to affecting unpaid work as a primary policy objective, but have implicit effects on unpaid work, or influence unpaid work as an explicit secondary objective. Most of the mainstream socio-economic policies, however, have implicit effects on unpaid work. Even if this study relates to both aspects, it might provide useful evidence for the choice of specific policies, since new policy routes should attempt at making unpaid family work more visible, thus requiring first a methodology to measure its value, which is the objective of this research.

In order to overcome the lack of information at EU level, this paper focuses on two member states, Italy and Poland, chosen for the quality of data on unpaid family care work, for the comparability of their surveys and for the high level of data harmonisation with EUROSTAT guidelines. They might constitute a good example of how to improve EUROSTAT surveys, in a rather simple way, to measure unpaid family care work.

For this study, the original micro data on time use have been made available by the respective National Statistical Offices. The availability of micro data allows for the improvement of the analysis under two respects. First, it offers a richer representation of family care activities, which includes, at variance with data used in many studies at both the European and national levels, family care provided to the elderly. Second, it allows for the application of more appropriate statistical techniques to link time use data to household survey data. Both the opportunity cost method and the replacement cost method are applied in order to evaluate the potential informative gain with respect to other analyses conducted on the available EU surveys. The paper is organised

as follows: Section 2 reviews the literature, Section 3 provides a background comparison between Italy and Poland, Section 4 describes the data, Section 5 describes the methodology, Section 6 presents the use of time in unpaid family care work activities in Italy and Poland, Section 7 presents the result of the evaluation and Section 8 concludes.

2 Family child care and family care of the elderly: literature review

The literature on these issues is copious. A lot of work has been done, for example, on the relation between motherhood and labour market participation of European women on child care and womens participation, parental investment in children, fertility and labour market participation, all of them related to unpaid family care work. Even if the issue has become relevant more recently with the problem of ageing of European populations, a growing number of contributions concerns family care of the elderly. This section overviews the most recent analyses on these issues.

According to EUROSTAT in the EU25 in 2006, the number of children aged up to compulsory school age was estimated at around 30 million. Among these children, 26 per cent of those less than three years old were attending formal childcare, while the percentage rose to 84 per cent among those from three years old to compulsory school age. The children not attending formal childcare were cared for by a parent, child minders or relatives and friends. The proportion of those attending formal childcare differed significantly among Member States. For children aged less than three the highest percentages were recorded in Denmark (73 per cent), the Netherlands (45 per cent) and Sweden (44 per cent), and the lowest in the Czech Republic and Poland (both 2 per cent). For children aged three to compulsory school age, the highest proportions were observed in Belgium (98 per cent), Denmark (96 per cent) and France (94 per cent), and the lowest in Poland (28 per cent), Lithuania (56 per cent) and Malta (57 per cent). For childcare of 30 hours a week or more, the highest shares in the age group less than three were observed in Denmark (66 per cent), Portugal (32 per cent) and Sweden (27 per cent).

The evidence documenting at all level of analysis a positive relation between female participation and child care services in Europe is by now very abundant. Among the most recent examples, Del Boca et al. (2008, 2009), using data from the European Community Household Panel (ECHP), explore the impact of social policies and labour market characteristics on womens decisions regarding work and childbearing. The two decisions are modeled jointly and, in addition to personal characteristics, variables related to the childcare system, parental leave arrangements, family allowances, and labour market flexibility are included. Their empirical results show that a non-negligible portion of the differences in participation and fertility rates for women from different European countries can be attributed to the characteristics of these institutions, and that the environmental effects vary by educational level. While labour market arrangements, such as part-time opportunities (when well-paid and protected) have a larger impact on the outcomes of women with higher educational levels, childcare and optional parental leaves have a larger impact on the fertility and participation decisions of women at lower educational levels.

Turning to area studies, Lewis et al. (2008), using the European Social Survey 2004/5, analyse

how parents reconcile employment and child-care in Western European member states, and how much the EU-level policy on enhancing the formal provision of child-care is consistent with their preferences. They use information on working patterns and preferences, and on child-care use and preferences regarding the amount of formal provision. They find that working hours in formal employment remain a very important dimension of reconciliation practices, with large differences in both patterns and preferences. There is very little evidence of convergence towards a dual, full-time worker model family outside the Nordic countries, although the balance between the hours which men and women spend in paid work is becoming less unequal. Portuguese women express a strong preference for much more formal child-care; Dutch, German and British women are relatively satisfied with the amount they have, despite having much less developed formal provision than the Nordic countries. The authors conclude that, strong preferences for changes in working hours provide support for the development of policies that include child-care leaves, entitlements to part-time or flexible patterns of work, as well as formal child-care. Since countries vary enormously in terms of the nature of the existing policy package and patterns of adult labour-market participation, respect for parental choices is increasingly an issue with regard to the gender divisions of unpaid care work and employment.

Some previous studies reached a different conclusion. Larsen (2004), for example, examines the work and care strategies chosen by full-time working families with children in Finland, Italy, Portugal and the UK. The study investigates whether European families in different countries, facing the same problems of balancing employment and childcare responsibilities, respond to their situations in similar ways. Using qualitative data from the SOCCARE project, the author makes a comparative analysis of couples in similar work and care situations. Using their working hours as the common denominator, the paper analyses their daily childcare arrangements and how these are impacted by gender roles, working schedules, workplace flexibility, income levels, parents' educational background and availability of care facilities. At variance with much of the literature reviewed in this section, the paper concludes that European families' work and care strategies have many similarities and national differences may not be as marked.

The paper by Nicodemo and Waldmann (2009), focusing on the Mediterranean countries, analyses the connection between the married women's labour force participation, child care arrangements, and the time that husbands and wives spend taking care of children. They use the EU-SILC (European Survey on Income and Living Conditions) cross-section 2006 and data from the ECHP (European Community Household Panel) in 2001, because these two data-sets provide different information about child care and domestic work. The results show that while the Mediterranean countries have advanced in the integration of women into the labour market, in most of them women still have to bear the total burden of domestic work and care of children. They find that child care arrangements are a major instrument for women to enter in paid employment.

Turning to specific studies that investigate child care regimes, a comparative study on childcare services based on EU-SILC data (Plantenga and Remery, 2008) assesses the current state of affairs of formal child care arrangements in Europe. It emerges that the presence of a child affects female employment rather heavily, especially in the Czech Republic, Hungary and Slovakia. The total fertility rates are below replacement level in all EU Member States, but prove to be especially low in countries with low female participation levels. There is strong evidence that a sufficient supply

of childcare services has a positive impact on participation, the fertility level and social inclusion. Bettio and Plantenga (2008) suggest two indicators, intensity of informal care and the availability of child services, to be based on data drawn from ECHP. The informal care intensity index is based on (i) the number of adults devoting at least two hours per day to caring for children, or elderly or disabled persons, divided by the number of potential beneficiaries; (ii) the proportion of households which do not pay for regular child care services, divided by the total number of households with children. The highest values for this index are found in Mediterranean countries (Italy, Greece and Spain), whereas the lowest values are found for Scandinavian countries (Denmark and Finland; data for Sweden are not available). The availability of child services index is based on (i) the number of children under the age of three cared for by formal arrangements over the total number of children of the same age group; (ii) children between three years old and the mandatory school age cared for by formal arrangements (outside the family) as a proportion of all children of the same age group; (iii) the (prevalent) public/private nature of the child care facilities. However, they then do not find adequate data sources on which to construct the index, and have to rely only on the coverage rate of formal child care facilities for the youngest children. This index has the lowest values in the Mediterranean countries and the highest in the Scandinavian countries.

As for the new member countries of the EU, Szelewa and Polakowski (2008) compare childcare provisions. They take into account two pillars of childcare policy: publicly provided childcare services and parental leave provisions. In contrast to previous studies, they provide evidence of cross-country variation of childcare policies within the region. These differences are systematised by identifying four clusters of childcare policy. These are: “explicit familialism” (the State pursues some active policies to support the traditional family model), “implicit familialism” (policies are residual and formally neutral, with the assumption that family should not be interrupted in its task of educating children), “female mobilising” (policies support female participation easing the provision of private and public formal child care to be paid by households, rather than through parental leaves) and “comprehensive support” (the State pays child care to employed couples). The countries are clustered as follows: the Czech Republic, Slovakia and Slovenia in the explicit familialism policy model; Estonia and Latvia in the female mobilising type policy; Lithuania and Hungary pursuing the childcare policies typical of the comprehensive support model; and finally the childcare policy in Poland resembles characteristics of the implicit familialism model.

Time spent with children represents a fundamental investment in their development, and institutions play a crucial role as mediators between the female labour supply and time devoted to children. Ichino and de Galdeano (2005) have called attention to the role of child care and working-time arrangements, comparing evidence based on time use data for three countries: Italy, Germany and Sweden. While in all these countries working mothers appear to dedicate less time to child care than non-working mothers, in Sweden the difference between the two groups is the smallest. In Italy maternal work is associated with the largest loss of maternal child care. To shed light on the possible reasons for this finding they consider the role of part-time job opportunities and formal or informal child care arrangements. They argue that while child care facilities increase mothers access to employment, it is the availability of flexible working arrangements that allows them to work and still have enough time to allocate to child care.

Joesch and Speiss (2006), using data from the 1996 wave of the European Community House-

hold Panel for mothers with children under 16 years of age, compare how many hours per week mothers reported looking after children in nine European countries. They also explore to what extent cross-country differences in socio-demographic characteristics and parental employment contribute to differences in maternal time spent looking after children. They find cross-country differences in the mean number of hours mothers reported looking after children. Only a small portion of these differences is explained by variation in socio-demographic characteristics and employment status. Country-specific policies aimed at reconciling parenthood and employment appear to explain some of the differences.

Cardoso et al. (2008) introduce choices made by children themselves into the analysis of parental investment in children. They model the use of time of young people aged 15 to 19 in activities not only related to study, but also to social-networking which can enhance personal interaction skills. Using data on time use for France, Italy and Germany, they study the link between time allocation by parents and time allocation by youngsters. Countries diverge with regard to the association between parents and youngsters allocation of time to socialising and to reading and studying activities, with Italy standing out as the country where that association, in particular between youngster and mother, is strongest. Their results are consistent with different mechanisms: parental role models directly influencing childrens behaviour, intergenerational transmission of preferences, or network effects as individuals adapt their behaviour to social patterns.

Chalasanani (2007) shows, on data drawn from the American Time Use Survey for 1985 to 2003, that better educated parents used to and continue to spend more time with their children than the less educated. Although parents at all levels of education have increased their time with children over the years, the better educated have made relatively larger gains. Further, while mothers spend more time with children than fathers, the ratio of mothers to fathers child time was and continues to be lower for the better educated than the less educated.

Increasing attention has recently been put on the welfare consequences of elderly care provision in ageing societies. The policy question is how to choose the optimal mix of elderly care services and money transfers to families without either increasing public spending or producing disincentive employment effects. Some literature has taken advantage of the Survey of Health, Ageing and Retirement in Europe (SHARE, 2008), a multidisciplinary and cross-national panel database of micro data on health, socio-economic status and social and family networks of more than 40,000 individuals aged 50 or over. However, due to the lack of detailed information in many time use surveys of European Member States, there is no research on time spent with the elderly based on time use data. This section first reviews the studies on the relation between unpaid family elderly care work and female employment and then discusses the potential effects on unpaid family care work of different elderly care regimes in Europe.

Faced with tight budgets, a recent trend in the EU countries has been to re-direct transfers from public provision of elderly care to informal care. As shown by Jenson and Jacobzone (2000) these benefits represent a compensation for the costs incurred in care giving, particularly when compared with a situation without benefits. However, they are sometimes offered at only symbolic levels, and do not appear necessarily to minimise gender-related inequalities. Their welfare-enhancing effects depend on their level. Their effects on women care-givers, and in particular on their participation in paid labour market activities, depend primarily on the level of benefits, as it is this which largely

determines the reaction of care-givers to such benefits. However, the modest rates of benefits mean that they are unlikely to have been the main determinant of care provision in the majority of cases: care is provided because of need (and would have been even if no benefits had been paid). Some other studies show that this expectation of replacement of formal care with informal care may have turned out to be in conflict with the target set in the European Employment Strategy for female employment rates in Europe. In fact, some research on the relation between informal care and labour force participation gives evidence of a negative relation (for the US, see Ettner, 1996; Kolodinsky and Shirey (2000). For Great Britain, Henz (2006), using retrospective family, employment, and caring data from the British Family and Working Lives Survey 1994-1995 for 9,139 British men and women, finds that family roles but not employment characteristics were relevant for men and women taking up caring. Being in a lower social class was, however, an important predictor of female carers leaving the labour market. Starting caring and quitting the labour market because of it were not affected by women working part time, nor by most aspects of job flexibility that were considered.

Sarasa (2008), using pooled ECHP data, analyses the effects of old age and disability benefits on women's decisions to allocate time to adult care giving. The main conclusions are the following: (i) non-means-tested provision of benefits lowers the risk of heavy adult care giving among all women, while means-tested benefits have no significant effect on poor women's behaviour, and (ii) providing services is more efficient than cash transfers in reducing women's probability of allocating many hours to adult care. Viitanen (2007), using the same data set but exploiting its panel nature, finds that an increase in government expenditure on formal residential care and home-help services for the elderly significantly decreases the probability of providing care to elderly parents living outside to household for a sample of European women aged 45-59. Contrasting the recent tendency of long-term care policies, some simulation results in the same paper show that increasing government expenditure on formal residential and home-help for the elderly can significantly increase the labour force participation rates of women across Europe.

The SHARE report Simonazzi (2008) (SHARE, 2008) provides descriptive evidence of the fraction of people helping old parents conditional on labour force participation. It emerges that there is stark cross-country heterogeneity. In Greece, Sweden and Denmark time spent in helping old parents does not depend on labour force participation, while in many other countries workers provide significantly less of this type of care than non-workers. Some studies based on the SHARE data set provide econometric evidence of the relation between formal and informal care giving and the effects on women's choices. For example, Crespo's (2006) estimates based on SHARE data show the causal effect of providing intensive informal care to elderly parents on labour market participation decisions of a sample of European daughters. The estimated probability of participating in the labour market is negatively affected by care giving for both Northern (Sweden, Denmark and the Netherlands) and Southern (Spain, Italy and Greece) countries. Moreover, a substantially stronger effect is found when care-giving and labour market participation are considered as being mutually dependent: more labour market participation means less care-giving. This shows that the potential opportunity costs in terms of reduced employment associated with the provision of informal care by women are seriously underestimated under the simplifying assumption that the direction of causality is such that more care-giving leads to less participation in the labour market.

As for the specificities of child care regimes, the need to restrain public spending has, in the past decade, obliged many European countries to restructure the system of social care. In this context, the case of long-term elderly care offers an example of reforms that have tried to rationalise the linkages between paid and unpaid work across key forms of provision. Pavolini and Ranci (2008), studying the case of six European countries, find that a special weight has been attached to home care services and measures aimed at supporting family care. While in Sweden and the United Kingdom home care services have been concentrated on the most serious cases, the countries of continental Europe have introduced the most significant innovations, with Germany investing mostly in family care, while France and the Netherlands also promoted greater provision of professional home care services as part of a new approach designed to combine employment creation with greater coverage of social needs. Italy stands as an example of what might be the consequences of the reforms, with a recourse to female migrant workers to such an extent that the Italian traditional family model of care is becoming a “migrant in the family” model of care (Bettio et al., 2006). This model stems from the recent experience of replacing unpaid family carers with low-cost immigrant workers directly employed by the families and often cohabiting with the elderly. This new model has spread across Southern Europe and raises complex issues of equity and sustainability from an employment perspective.

A strand of literature tests the hypothesis that informal care given by family members to the elderly is a substitute for formal care in Europe. Bonsang (2008), for example, focuses on two types of formal home care that are the most likely to interact with informal care provided by adult children: paid domestic help and nursing care. Using SHARE data, the results indicate that informal care substitutes for paid domestic help and that this substitution effect tends to disappear as the level of disability of the elderly person increases. In fact, informal care is complementary to nursing care only to a limited extent, independently of the level of disability. These results highlight the heterogeneous effects of informal care on formal care use and suggest that informal care is an effective substitute for long-term care as long as the needs of the elderly are low and require an unskilled type of care.

As for time spent by adult children caring for parents, some small-scale studies have documented that when people assume the role of assisting a person with impairments or an older person, care activities account for a significant portion of their daily routines. Nevertheless, little research has investigated the problem of measuring the time that carers spend in care-related activities. Bittman et al. (2005) contrasts two different measures of care time. One is an estimate of average weekly hours drawn from a question in the 1998 Australian Survey of Disability, Ageing and Carers. The other is an estimate drawn from diaries in the 1997 national Australian Time Use Survey. Their study finds that diaries provide information for a more robust estimate, but only after one models the time use patterns in the days of carers to identify care-related activities, which diarists do not necessarily record as care. Such a measure of care time reveals that even people who offer only occasional assistance to a person with impairments tend to spend the equivalent of more than 10 minutes a day providing care.

The SHARE survey provides some evidence on the incidence and intensity of elderly care provided by adult children. Germany, Greece and the Czech Republic are the countries with the highest proportion of children helping. The rate for the Czech Republic, in particular, is noticeably

higher than for the rest of the SHARE countries. This rate is in line with other surveys run in the same country: a substantial amount of care within the family is traditionally expected and delivered in this country. Turning to the intensive margin of help, i.e. to the number of hours spent providing informal care, a clear North-South gap arises: this is consistent with the sociological literature (see, as an example, Bittman et al., 1998): family ties are stronger in Mediterranean countries, and they induce adult children to think about formal care as something to avoid as long as family members are able to help for their elderly relatives. There is a substantial cross-country heterogeneity and cultural differences explain part of it, but individual choices are likely to depend on differences in institutional long term care systems as well.

Summarizing, the main evidence stemming out of the studies on child care shows that parental choices are increasingly an issue with regard to the gender divisions of unpaid care work and employment. Although countries vary significantly in terms of the nature of the existing policy package and patterns of adult labour market participation, some regularities emerge from the literature reviewed. According to the main findings of this literature, child care work continues to be predominantly carried out by women. Time spent in child care is negatively related to female participation to the labour market and to the number of hours women work.

Differences in participation and fertility rates for women from different European countries can be attributed both to household/individual characteristics and to institutions. Among the former, one of the most important is the level of education. Education has a prominent role: it increases the probability of work, but also the number of hours parents spend with children, with different intensities in different countries. As for the role of institutions, childcare and optional parental leaves have a larger impact on the fertility and participation decisions of women at lower educational levels. Labour market arrangements, such as part-time opportunities (when well-paid and protected) have a larger impact on the outcomes of women with higher educational levels. These findings lead to the conclusion that, while child care facilities increase mothers access to employment, it is the availability of flexible working arrangements that allows them to work and still have enough time to allocate to child care.

The choice of the policy mix of labour market arrangements and formal child care largely depends on country specificities. The categorisation of countries into groups with similar characteristics, reveals that the Nordic countries show the lowest gender gaps in child care and a mix of policies that eases both parental work and family child care. Women in the Mediterranean countries, instead, even if advancing in terms of integration into the labour market, still have to bear the total burden of domestic work and care of children. In this case, child care arrangements remain the major instrument enabling women to enter paid employment. The Western countries lie between these two extreme situations. As for the new member countries of the EU, there seems to be quite a lot of variety. The State pursues some active policies to support the traditional family model in the Czech Republic, Slovakia and Slovenia; policies are residual and formally neutral in Poland, while in Estonia and Latvia policies support female participation by easing the provision of private and public formal child care to be paid by households, rather than through parental leaves; both active and passive interventions to support womens work and families are present in Lithuania and Hungary.

As for studies on elderly care, the main finding is that, as documented by the literature re-

viewed, a recent trend in the EU countries has been to re-direct transfers from public provision of elderly care to informal care within families. The expectation of substitution of formal care with informal care may have turned out to be in conflict with the target set in the European Employment Strategy for female employment rates in Europe. In fact, some research on the relation between informal care and labour force participation gives evidence of a negative relation. However, the effects of these benefits on female care-givers, and in particular, on their participation in paid labour market activities, depend primarily on the level of benefits, as it is this which largely determines the reaction of care-givers to such benefits. However, the modest rates of benefits mean that they are unlikely to have been the main determinant of the conflict between care provision and labour market participation of women.

Despite the stark cross-country heterogeneity, the available evidence seems to support the higher effectiveness, under many respects, of formal care with respect to informal care. The increase in government expenditure on formal residential care and home-help services for the elderly significantly decreases the probability of providing care to elderly parents living outside the household and increases the labour force participation rates of women across Europe.

In particular, professional home care services and measures aimed at supporting family care have been tried in continental Europe and some Nordic countries as part of a new approach designed to combine employment creation with the greater coverage of social needs. At variance with these experiments, in some other countries, mostly Mediterranean, the recent experience is the replacement of unpaid family carers with low-cost immigrant workers directly employed by the families and often cohabiting with the elderly. This new model raises complex issues of equity and sustainability from an employment perspective.

One strand of literature tests the hypothesis that informal care of the elderly by family members is a substitute for formal care in Europe. Two types of formal home care that are the most likely to interact with informal care provided by adult children emerge: paid domestic help and nursing care. Using SHARE data, the results indicate that informal care substitutes for paid domestic help and that this substitution effect tends to disappear as the elderly persons level of disability increases. In fact, informal care is complementary to nursing care only to a limited extent, independently of the level of disability. These results highlight the heterogeneous effects of informal care on formal care use and suggest that informal care is an effective substitute for long-term care as long as the needs of the elderly are low and require an unskilled type of care.

3 Background: a comparison between Italy and Poland

The increase in the rates of participation in the labour market is definitely one of the highest priorities of Polish economic and social policy. The employment rate in Poland is among the lowest in the EU countries (with the employment rate for women being the fourth lowest after Malta, Italy and Greece), a considerable distance from the Lisbon Strategy targets. At the same time fertility rates in Poland are relatively low (below replacement rate) and the proportion of elderly people is growing. As a result Poland faces a complex problem of reconciliation of both economic and family activity and public policy in this area becomes a real challenge.

In Polish society is observed the coexistence of two family economic models: the traditional

model, with the economic activity of women being subordinated to phases of family life and family duties, men being the breadwinners and women taking care of housework and children; and the partnership model, with equal responsibility between men and women in providing income and taking care of children. Although the partnership model is receiving growing support, particularly among well-educated women from urban areas, there is still strong support for the traditional model. However, even among young and educated women there is a strong conviction that the problem of reconciliation of professional and family life is a purely female problem.

The need for care is a common problem of most Polish households; two groups particularly burdened with care activities are women aged 30-39 (and men aged 35-44) and persons at pre-retirement age (caring for their parents and for grandchildren). In the households where care is needed, it is usually provided within the household: in the case of child care needs it is estimated to be provided by household members in three-quarters of cases; proportions for adult care are even higher and exceed 80 per cent. Generally the support from unrelated persons and institutional assistance is marginal; however patterns of childcare and care for adults clearly differ between the countryside and cities, particularly big ones.

The care provided within the household is a domain of women. Bobrowicz (2007) estimates the total weekly time spent on care to be equal to 10.5 hours for women and 4.7 hours for men. In spite of the fact that the main burden of care activity lies with women, the share of women who choose to reconcile work and taking care of children at pre-school age is quite substantial. Grotkowska (2007) estimate this share to be equal to 40 per cent in the case of women bringing up a child aged three or less and almost 50 per cent for women with children aged 4-6.

Key problems indicated as obstacles for the reconciliation of economic and family life are work organisation (lack of flexible working time arrangements, taking time off, home-working, part-time working etc.) and the lack of access to high-quality care institutions. Institutional care for children is underdeveloped with an insufficient supply of places in public institutions and limited access to private sector institutions (with relatively high prices). An even more severe situation is observed in the sector of adult care where the care is often only provided by hospitals leading to inefficient resource allocation.

The level of women's economic activity is determined by the characteristics of their family and their need for care. The model of the family, uneven share of family and household duties, lack of institutions providing care, difficulties in re-entering the labour market after a maternity-related break are all determinants in women's participation in the labour market. Relatively long times devoted by women to work are partly a result of the low average level of wages in Poland; it increases pressure on particularly low-educated women to undertake a professional activity since, due to low wages, they are unable to afford housework and care services on the market. As a result it is a group characterised with the highest average total working time. The wage elasticity of women's labour supply is lower than in the case of men (Haan, Myck 2008).

Participation in care is often studied to understand the determinants of the low participation of Italian women in the labour market. Italian women's participation is among the lowest in Europe. The female employment rate stands almost 13 percentage points below the EU average and 22 below the Lisbon target. However, Italian women report one of the lower gender-wage differentials among OECD countries even if some studies assert that the gap between the wages of men and

women is underestimated if it is not taken into account that only the more educated and qualified women have access to the labour market (Olivetti and Petranolo, 2008). The issue of unpaid family care work is not novel in the economic literature on Italy. There are several studies on the use of time in Italy; those relevant for this study are reviewed in Section 2. Most of them use the previous survey of the Multipurpose Time use Survey by ISTAT (Italian Central Statistical Office) and only a few recent still unpublished studies use the same source used in this report. Here, the most recent survey, relating to 2002/2003, is used for the analysis. As for the value of unpaid family care work, the only existing example is the work by Addabbo and Caiumi (2003), which, however, was more focused on the role of unpaid family care work for household income distribution. Moreover their study was based on matching the time use survey with the household income survey of the Bank of Italy, which is not used here. Here, instead, EU-SILC data for Italy are used to match wages and incomes.

4 Data

To estimate the value of unpaid family care work the ideal source is a data set with both the hours devoted to unpaid family care work and the labour earnings necessary to estimate its value. This is the case of the Polish time use survey that both includes questions on time use and earnings.

The Polish time use survey is a cyclical survey carried out by The Central Statistical Office. It is based on the representative sample of the households indicative of 6 socio-economic groups (employees, employees with access to agricultural farm, farmers, self-employed, old-age and disability pensioners and persons living on non-working sources of income). The most recent survey was carried out in 2003-2004 and consisted of three parts: a household questionnaire (filled in by a head of the household), a personal questionnaire and a time use diary.

The household questionnaire referred to all household members, irrespective of their age and was filled in by the head of the household. It consisted of 33 questions regarding the composition of the household (with information on gender, age, family relationship and economic activity of each household member), living conditions (type of building, size and fittings of the dwelling, access to the internet), the household's activity regarding growing plants and keeping animals, income of the household (main source of income and its level), assistance obtained and use of different external services.

The personal questionnaire was addressed to all household members aged 15 and above. It consisted of 53 questions grouped in modules regarding different groups of enquired household members. Groups were defined by the type of economic activity. Persons that declared working in the week preceding the survey answered questions concerning the type of organisation they worked for, its ownership, size, sector, type of occupation, type of job, type of contract, time of work, income, second job. Persons that didn't work in the week preceding the survey were asked standard questions allowing for the assessment of their activity (forms of looking for work, readiness to undertake a job for two weeks). All persons filling in the questionnaire were asked to answer questions concerning their education career (past and present), voluntary work and community service, assistance offered to persons from outside their household and some information on their health

status (illness and disability).

The third questionnaire was a time-use diary - a booklet concerning a list of all activities carried out during a 24-hour span (from 4 AM to 4 AM) divided into 10-minute intervals (144 intervals per day). The diary included information on the main and secondary activity during each span (parallel activity), persons accompanying a surveyed person during a given activity (four categories: alone, with children under 9 from a given household, with another person from a given household and with persons from outside the household) and location of a given activity (or transport mode in case of activity connected with moving). There was also some additional information concerning completing the diary (where it was completed, if it was a special or unusual day, if enquired persons were travelling during that day, where he/she was at the beginning of the record and at the end of the record). All activities were grouped in ten groups: physiological needs, professional work, education activity, household activities, voluntary work in organisations and beyond, social life and entertainment, sport and recreation activities, personal hobbies, using mass-media, time spent on moving and transportation. The instruction for enquirers listed 198 different activities. The time use diary was filled in twice: once on a week day (Monday-Friday) and once on a weekend day (Saturday or Sunday).

As said before, one of the most important advantages of the Polish time use survey is information on income - both personal (in the case of the working population) and household. Out of 10,256 households that were asked the question on its average income, 6,468 answered the question directly, 1,325 indicated a range of income and 2,463 (24 per cent of the total number) refused to answer the question. Concerning personal income: out of 20,264 persons being enquired, 9,994 were found to be working (with 7,032 employees and 2,049 self-employed). As for net labour earnings questions, in the group of employed 4, 617 persons indicated a precise sum, 950 persons indicated a range of earnings and 1,465 (21 per cent) persons refused to answer the question. In the group of the self-employed, 937 persons indicated an exact amount, 181 persons indicated a range and 931 (45,4 per cent) persons refused to answer the question on income. The rate of refusals does not seem to differ from other similar surveys but it requires care in drawing conclusions on average income. The sample is large enough to allow for the drawing of some conclusions on regional differences in family work.

Unfortunately a survey as inclusive as the Polish time use doesn't exist for Italy since the Italian time use survey, i.e. Multipurpose 2002/2003, doesn't include questions on earnings. To overcome the lack of earnings information in the Multipurpose 2002/2003 survey we matched the Multipurpose survey with the cross-section for Italy drawn from the European Statistics on Income and Living Conditions (EU-SILC by EUROSTAT) for 2006. The main difficulty of using information collected from different surveys jointly is that the interviewed individuals are not the same. The usual strategy to overcome this problem is to match the two data sets assigning to each individual in one data set (e.g. Multiscopo) the information of the other data set (e.g. EU-SILC) according to a series of characteristics, available in the two data sets, which are believed to be relevant to explain the observed heterogeneity. The matching technique adopted in this study for Italy is described in Section 5, here we briefly describe the two matched data sets.

The Italian Multipurpose (Multiscopo) time use survey collected by the Italian Institute for Sta-

tistical ISTAT in 2002/2003, provides detailed information on adult care activities (disabled, sick) and child care activities. It is composed of three data sets based on different questionnaires: 1) the individuals' data set based on the individuals' questionnaire, the households' questionnaire, a questionnaire with questions related to the compilation of the daily questionnaire, and some created variables 2) the episodes' data set based on the daily questionnaire and 3) the weekly day data set based on the weekly diary.

The individuals' data set contains records for 51,206 individuals but the daily diaries collected are 47,012 (91.81 per cent). We have no information about how the 8.19 per cent of the individuals' sampled use their time. 16.48 per cent of the total available diaries have been collected in on a "particular day". "Particular days" are self defined by respondents and include holidays (18 per cent), travelling (15 per cent), personal or family health problems (10 per cent), unusual work or study engagement (8 per cent) and others. Since the aim of this study is the evaluation of the unpaid family care work at national level in a certain interval of time (i.e. one year) we decided to keep "particular day" in order to have in our sample an average of time spent in unpaid family care work computed on all the possible types of days that can occur in one year. The "particular days" in the sample, in fact, occurred randomly and should not bias our analysis. Each individual filled in the diary during weekdays or on Saturday or on Sunday. In order to obtain an individual estimation representative for the all Italian population and for the average weekly day it is necessary to multiply the weights by 5/7 for individuals who filled in the diary on a weekday and by 1/7 for those who filled in the diary on Saturday or on Sunday.

As in the Polish time survey in the Italian Multiscopo all the activities were grouped in ten groups: physiological needs, professional work, education activity, household activities, voluntary work in organisations and beyond, social life and entertainment, sport and recreation activities, personal hobbies, using mass-media, time spent on moving and transportation enabling a detailed analysis of the time each household member spend in each activity. Unfortunate, the main drawback of this survey is that it does not collect information on household earnings and income. To overcome this limitation we used, jointly with the Multiscopo survey, the Italian EU-SILC survey 2006.

EU-SILC 2006 is a European household survey for 24 EU member States plus Norway and Iceland, which are not included in this study. The dataset is rich in information on several household and individual variables, such as work status and characteristics, household income, taxes and benefits, family composition, health and education. EU-SILC, also collects information on individual labour earnings, but does not collect information on the use of time, which makes it impossible to use it as a unique source for the evaluation of unpaid family care work.

5 Methodology

The purpose of this section is to explain how the value of unpaid family care work is estimated. The basic idea is to attribute a value at each hour people spent in unpaid work inferring from the value of paid work.

As discussed in Section 2 there are two methods of attributing a labour earning to the unpaid family care work. One is called the opportunity cost method and is based on the assumption that the time spent in unpaid family care work reduces the time spent in paid work. This method aims to

evaluate the opportunity cost, that is, the value of the next best alternative forgone as a result of making the decision to spend time in unpaid family care work.

The alternative method is based on the assumption that households save money by performing family care work by themselves instead of buying the services on the market or hiring someone to do it. This method is known as the market replacement cost method. Even if conceptually different, both methods require the imputation of a wage for each unit of time spent in unpaid family care work.

The opportunity cost approach relies on the assumption that each hour devoted to domestic activities could be sold on the labour market. Such a hypothesis implies that each hour devoted to care activities should be evaluated at the labour earnings that individuals who perform care activity could have got if they decided to sell their time on the labour market instead of spending it on care. For working people the value imputed to unpaid work is equal to the earnings they obtain for their work in the labour market. For the non-working population, we have to estimate their potential earnings. We dealt with the problem using the Heckman Selection (HS) model (Heckman, 1979), separately for men and women.

As for the market replacement cost method two procedures has been used: the general market replacement cost method and the specialist market replacement method. As was already mentioned, the generalist market replacement approach aims at assigning a general household worker wage to each hour of unpaid household work. The reference labour earning is exogenously assigned independently of the specific characteristics of households and individuals but separately for men and women. The total value of unpaid family care work at national level depends on (i) the amount of time that each person devotes to this activity, (ii) the value attributed to each unit of time, and (iii) the number of people who perform it.

However, before to present findings the approach used for Italy for which time use information and earnings information is not available in the same data set. As we said in Section 4, the ideal source for the purpose of the evaluation of the unpaid family care work would be a survey including both the use of time and individual earnings. This would enable the imputation of a earnings to people who are not at work for the time they spend in unpaid work. Unfortunately it is quite rare that these two pieces of information are both present in the same data set. As we discussed in Section 4, this is the case of the Polish Time use survey but not of the Italian Multipurpose (Multiscopo) time use survey.

To overcome this limit we match the Multipurpose 2002/2003 data set with the Italian EU-SILC 2006 data set. They are both the most recent data sets of this type available for Italy. In the remaining part of this section we are going to explain how the statistical matching between the two data sets is performed.

5.1 The statistical matching

To make matching feasible two conditions must hold: (i) the two surveys must be random samples of the same population (ii) there must be a common set of conditioning variables in the recipient and in the donor data set. In our cases the first condition is satisfied since both Multipurpose and

EU-SILC data sets are randomly selected from the Italian population. The second condition is also satisfied after some recoding of the common information in the data sets.

The EU-SILC 2006 contains detailed information on the wages, income and wealth of family members, labour market activities, and socio-demographic characteristics of the household but not information on child care and time use. On the other hand the Multipurpose 2003/2003 survey collects information on family structure, past and present working experiences, use of social services and use of child care.

Once this common set of characteristics is chosen and properly coded we created a new data set “appendin” at the Multipurpose survey data set the EU-SILC 2006 survey data set. The Multipurpose 2002/2003 sample includes 21075 households for a total of 55773 individuals. The EU-SILC 2006 sample contains observation for 61542 individuals. This new data set has missing values on labour earnings on all the observation that are originally from the Multipurpose survey. Our aim is impute a labour earnings value to these missing values.

The new data set are then divided into four sub-samples: 1) men at work 2) women at work 3) men not at work 4) women not at work. This is motivated by two reasons. First, in this way more homogeneous samples are obtained before proceeding with the imputations of wages. Second, the creation of sub-samples for people at work enables the inclusion in the match of sub-samples 1) and 2) a larger set of variables. In fact, for much of these samples we can take into account all the variables related to the job activities (e.g. occupation, sector, full-time or part-time job, and so on).

However, behind the decision of dividing the sample between people at work and people who are not at work there is also a theoretical motivation. For people at work in Multipurpose the wage is unobserved because the questionnaire does not include questions on wages and earnings. However, even if unobserved they have a wage and the imputed wage will represent the estimated value of the not-reported wage. On the contrary, people not at work could not report their wages even in the presence of the question in the Multipurpose questionnaire. For them the imputed wage represents a potential wage. The evaluation of unpaid family care work presents a problem of missing data. The aim is to have the multipurpose data set completed for the n observations with an additional column for the imputed wages for people who perform unpaid family care work.

A variety of techniques could be used in order to perform imputation. The choice of the technique is subject to the missing mechanism. When the missing data are a random sample of observable data the missing mechanism is called MCAT (Missing Completely At Random). In this case the missing data is not dependent on observed or missing data. If the probability of an observation to be missing depends only on observable data but not on unobservable missing data the missing mechanism is called MAR (Missing At Random). The MCAT is the best scenario and enables one to obtain unbiased results even with simple approaches. The MAT scenario can also enable one to obtain unbiased results but only if more advanced approaches are applied. When the missing values are generated by a “non answer process” it is quite difficult to establish the missing mechanism. However, in some cases the researcher can be confident that the missing mechanism is a MCAT (Schafer, 1997). This is when information is not available because the question was not introduced in the questionnaire; in this case the missing mechanism depends on the sampling design. This is our case. In fact, the questions on earnings are not in the Multipurpose sample and so the missing

values in earnings depend on the sampling design that is random for the Italian population. Once we established that the missing mechanism is a MCAR we can use different techniques which rely on this assumption. The analysis on Italy in this study is conducted using the Propensity Score Matching (PSM) for the opportunity cost method and the hot deck imputation for the replacement market cost method.

The propensity score is defined as the conditional probability to be assigned at a treatment given a vector of observable covariates (Rosenbaum and Rubin 1983). In the imputation context the PS estimates the “likelihood/probability” of “having the outcome observed” for any subject with a similar background measured by the independent variables. Subjects with close propensity scores are considered “similar” and will be matched together. To impute the labour earnings for the opportunity cost method working men and working women observed in the Multipurpose survey are match with working men and working women observed in EU-SILC controlling for all their relevant observable background characteristics. For these two sub-samples we also control for job characteristics in order to match individuals who perform “similar jobs” in “similar conditions”(e.g. same sector, same type of contract). In this way it is possible to impute the value of unobserved labour incomes to people at work sampled in the Multipurpose survey. These labour incomes will be used as a proxy of the opportunity cost of the time spent in unpaid family care work for workers sampled in the Multipurpose survey.

Non-working men and non-working women in Multipurpose survey, for whom labour incomes are obviously not observed, are also matched with the sub-samples of working men and working women with similar characteristics in EU-SILC.

The matching procedure is the same as the one used for the two sub-samples of working men and women in both Multipurpose and EU-SICL data set but the set of covariates used and the output obtained are different. Here, only the background characteristics (and not job-related variables) can be used as covariates for the match and the imputed labour earnings are the potential labour earnings of non-working people. The imputed earnings are then used as opportunity cost for individuals who are non-working. The method adopted for the matching is the Propensity Score Matching using the “Nearest neighbours matchin” procedure. The intuition behind this procedure is to assign to each individual who performs unpaid care work in the Multipurpose survey the labour income of the individual observed in the EU-SILC survey with the closest characteristics (i.e. age, marital status, education, etc.).

For the replacement cost approach a different imputation method has been used, e.i. the hot deck procedure. The hot deck procedure replaces the variables in the “missing lines” with the corresponding values in the “complete lines” stratifying the sample by selected variables. This imputation applies the Approximate Bayesian Bootstrap Imputation (ABBI) method of Rubin and Schenker (1986). In a multiple imputation hot deck can be used several times in order to impute missing values stochastically rather than deterministically. A major assumption with the hot deck procedure is that the missing data are either missing completely at random (MCAR) or are missing at random (MAR), this is not a restrictive assumption in our case.

6 The Time spent in Unpaid Family care work

Using time use survey, time spent in each activity can be computed as: 1) the average minutes for the population as a whole; or 2) average minutes spent in child care among people who perform child care. In order to make results more comparable, HETUS uses method (1) to compute time spent in each activity and reports the participation rates to compensate for the lack of information on the distribution of time among the population (i.e. some individuals do not perform any care). This is the method used in Table 1 and Table 3, which show the participation rate and the average time allocated to different activities by men and women in Poland and Italy respectively. The shown results are consistent with those reported in the previous literature. The other tables in this section use the average minutes spent in child care among people who perform child care (second method).

6.1 Poland

This section estimates the time spent in unpaid family care work in Poland with particular attention to differences in engagement in care activity related to gender and labour market status using the Time Use Survey from 2003/04, carried out by the Polish Central Statistical Office.

Table 1: Participation and average minutes per day spent in primary activities (people aged **18-74**) - Poland

<i>Primary daily activity</i>	Women		Men	
	Participation	Minutes	Participation	Minutes
Employment	29.1	130.4	43.8	220.5
Study	8.6	25.2	8.4	26.2
Domestic work	98.6	238.4	83.9	121.9
Child care	30.6	36.1	21.7	14.5
Adult care	4.1	1.1	2.7	0.7
Personal care	29.5	15.0	20.9	10.1
Leisure	12.3	14.1	11.2	16.2
Transport	98.6	244.2	98.4	291.6
Other	89.9	75.6	91.5	96.1

Source: Polish Time Use Survey 2003/2004, authors' elaborations.

The Time Use Survey shows lower participation in the labour market for women than for men (29.1 per cent against 43.8 per cent in the population aged 18-74 years). However, women always report a higher participation in unpaid work than men. Almost all women (98.6 per cent) are engaged in domestic work, and many of them are engaged in child and adult care (30.6 per cent in child care and 4.1 per cent in adult care). Men participate in unpaid work less often than women. Their participation rate in domestic work equals to 83.9 per cent, 21.7 per cent are engaged in child care and 2.7 per cent participate in adult care. Gender inequality is evident not only in the participation rates but also in time devoted to each activity. Men spend about 70 per cent more time on paid work than women (average time devoted to paid work equals to 3 hours 40 minutes for men and 2 hours and 10 minutes for women) Women spend more than 100 per cent more time than men on unpaid work (domestic and care activities), and they are definitely more burdened with

work: they spend 13.7 per cent more time on total work than men (on average total time devoted to work - both paid and unpaid - equals to 6 hours and 46 minutes for women and 5 hours 57 minutes for men). All these figures are reported in Table 1.

Being employed influences participation in care activities. Working women usually declare lower participation in child care than those who do not work. There is an apparent paradox evident for men's participation in child care: it is generally higher for those who work. This evidence is consistent with evidence shown for Italy and with other research that indicates a positive correlation between men's professional activity and the presence of children in their households which is result of the coincidence of both family and professional life cycles. Entrance to the labour market coincides with setting up families and having small children while leaving labour market usually takes place when children have already left the household or do not require care. For both genders the participation in adult care is much smaller than in child care. It is equal to 4.1 per cent for women and 2.7 per cent for men. For women, labour market status does not have an impact on the engagement in adult care. However in the case of men, those who do not work are more engaged in helping adults.

Table 2: Participation (%) and average minutes in child and adult care (primary and secondary) by gender and work status (people aged 18-74) - Polish

<i>Participation</i>	Non-Working		Working	
	Women	Men	Women	Men
Primary child care	29.6	16.7	35.2	27.8
Secondary child care	12.1	4.5	15.5	9.5
Primary adult care	4.1	3.2	4.1	2.3
Secondary adult care	0.4	0.2	0.3	0.2

<i>Minutes</i>	Non-Working		Working	
	Women	Men	Women	Men
Primary child care	145.4	89.2	108.5	73.6
Secondary child care	55.3	32.9	43.8	23.8
Primary adult care	41.5	46.2	31.9	30.3
Secondary adult care	23.7	28.5	17.7	23
Time in presence of children	197.7	127.1	164	118.3

Source: Polish Time Use Survey 2003/2004, authors' elaborations.

Note: Mean minutes are computed on the population performing care. Children less than 9 years old.

Women who participate in care activity spend on average more than 3 hours and 20 minutes per day in care activities (see Table 2). For men, their average time is equal to 2 hours and 20 minutes.

The structure of time spent on care differs between genders as well. Men divide the time they spend taking care of others almost equally between caring for children and adults. Women instead spend more time on child care (70 per cent of their time is spent on child care). Non-working women generally spend much more time on child care than those who are active in the labour market. The difference is particularly high in the second age group (31-40 years old), where it exceeds 50 per cent. It is also worthy of notice that in the last age group (60-74 years old) there are non-working women who devote more time to child care. These are retired women who live in

their child's house and take care of grandchildren.¹ By taking into account that often care is given while performing other activities (a mother goes shopping with her child for example), time spent on child care significantly increase: for women it reach almost 5 and a half hours per day, for men 3 and a quarter hours. Time spent on other activities in the presence of children is particularly high for young non-working women.

The activities of adult care are generally described in a less detailed way in a time use survey on which the analysis is based (no data on particular activities). Adult care is reported to be very low (2): the participation rate varies from 1.1 per cent for working men to 2.5 per cent for non-working women in the case of intra-household care. Rates for performing help in other households are higher. Similarly time devoted to adults' care (by those who declare being engaged in this kind of activity) are much smaller than in the case of childcare.

6.2 Italy

Table 3: Participation and average minutes per day spent in primary activities (people aged **18-74**) - Italy

<i>Primary daily activity</i>	Women		Men	
	Participation	Minutes	Participation	Minutes
Employment	27.5	109.9	51.6	248.3
Study	6.3	20.1	5	15.7
Domestic work	94.9	282.7	64.7	80.6
Child care	29.1	36.7	19	14.9
Adult care	12.8	8.3	9.6	6.4
Personal care	100	703.1	100	707.8
Leisure	96.2	208.1	97.2	271.2
Transport	87.8	68.4	93.8	92.5
Other	5.7	2.8	5.1	2.6

Source: Multipurpose 2002/2003, authors elaborations.

Note: Average minutes are computed on total population.

Table 3 shows a lower participation in the labour market for women than for men (27.5 per cent against 51.6 per cent in the population aged 18-74 years). However, women always report a higher participation in unpaid work than men. Almost all the women (94.9 per cent) are enrolled in domestic activities, 29.1 per cent perform child care and 12.8 per cent perform adult care respectively. Male participation in unpaid work is lower in all the activities, reporting 64.7 per cent in domestic work, 19 per cent in child care and 9.6 per cent in adult care. These results are in line with previous studies that show that the sharing of time among men and women between market work and household work is highly differentiated by gender (Goldschmidt-Clermont and Pagnossis-Aligisakis 1995). Italian Multipurpose data confirm the general finding of a higher total working time for women than for men (Winquist, 2004). Women's working time is notably higher

¹The analysis by cohorts is not reported in this study but is available under request.

than men's (7 hours and 9 minutes for women against 5 hours and 43 minutes for men) but men spend more than double the time of women in paid work whereas women's time spent in unpaid work is three times that of men.

Unpaid work can be distinguished in domestic work, child care and adult care. In all the unpaid activities women report a substantially higher number of minutes compared to men. The amount of time reported in Table 3 is partially affected by the participation rate. The average minutes, in fact, are computed on the total population and result in a lower amount of minutes for activities in which the participation is lower. This is particularly relevant, for example, for domestic work where there is a drastic difference in participation between men and women. However, the same problem arises for activities such as child and adult care in which the participation rate is conditioned not only by the individual's availability in performing the activity but also by the presence in the household of a child or an adult person who needs care. Table 4 focus on child care and adult care and compute time spent in care among people who perform care (method 2 described above). This approach gives a clearer idea about the time constraints faced by people involved in care activities.

Table 4: Participation (%) and minutes in child and adult care (primary and secondary) by gender and work status (people aged 18-74) - Italy

<i>Participation</i>	Non-Working		Working	
	Women	Men	Women	Men
Primary child care	25.6	9.3	34.4	24
Secondary child care	12.4	2.7	19.6	11.2
Primary adult care	14.7	16.1	10	6.4
Secondary adult care	1.2	0.4	1.1	0.3

<i>Minutes</i>	Non-Working		Working	
	Women	Men	Women	Men
Primary child care	134.8	86.6	116.5	76.8
Secondary child care	75.8	58	67	51.8
Primary adult care	66.2	75.4	60.2	55.3
Secondary adult care	39.2	34.6	50.5	19.3
Time in presence of children	382.3	285.5	289.8	234.6

Source: Polish Time Use Survey 2003/2004, authors' elaborations.

Note: Mean minutes are computed on the population performing care.

Children less than 10 years old

Female participation in primary and secondary care activities is higher for women than for men. Table 4 shows that 29 per cent of Italian women aged 18-74 are involved in primary child care and about 13 per cent in primary adult care. Men's participation in primary child care and primary adult care are 10 percentage points less and 3 percentage points less than women respectively. Empirical evidence suggests that care activities are mainly primary activities; in fact both women and men spend a substantially lower amount of time in secondary care activity than primary.

Participation in care activities is strongly affected by the individuals' life cycle. During their lifetimes individuals experience changes in their marital and economic status, household composition, economic and health conditions and so on. All these aspects affect their propensity to offer care or their need to receive care. The participation in care activities of a twenty-year old female student who lives with her parents is, for example, different from the participation of a forty-year

old woman with two children or a seventy-year old woman with a grandchild and an unhealthy husband. Since all these aspects are strongly correlated with individual age the computation of participation among age groups helps, at least partially, to control for them, enabling one to disentangle the average value reported for men and women (cohort analysis not reported but available under request).

The age distribution of the participation rate shows that women and men in the 31-50 age category are more involved in child care than younger or older people. This is not surprising since the fertility rate for women aged less than 30 years is very low in Italy and women and men older than 50 have older children who need less care. On the contrary, evidence on adult care shows a higher participation among men and women aged more than 40 years with a strong increase for people aged 51-74. This is due to the fact that, usually adult care refers to that of an individual's own parents who need more care as they become older and their children achieve maturity. Adult care, as a secondary activity, is much less probable than secondary child care, thus indicating a more absorbing set of tasks to be performed when caring for an elderly or disabled person. The comparison with previous studies based on less recent surveys suggests an increase in care participation in recent years. Addabbo and Caiumi (2003), for example, using the ISTAT time budgeted survey data 1989, report a participation rate of people in the age category 18-64 in care (both child and adult) of 10.8 for women and 17.0 for men. Although these values are not perfectly comparable with those in Table 3 because computed using a different age group category and a different data source they seem to indicate a notable lower participation in care in previous years.

Table 4 shows that women and men, in different work statuses, choose a different allocation of time. Young working men participate in child care more than non-working men of the same age (18-50 years). The contrary is observed for men aged more than 50 years. This apparently unexpected result is due to the heterogeneity of the category of non-working men. The low participation of young non-working men derives from the very low participation of students (about 3 per cent) who are all reported in the age classes 18-30 and 30-40 and the relatively low participation of pre-retired men in the 41-50 age class.

At variance with men, the participation in child care of working women in each age group is always lower than the participation of non-working women in the same age group.

Since the participation rate in child care here is computed on all women aged 18-74 the low participation rate observed can be due to the low fertility rate among working women. This suggests that women feel maternity and child care is a barrier to their participation in the labour market. This interpretation is supported by the statistics on participation in child care for households with young children (no reported here). For women in households with children aged 0-5 years old the participation rate in child care (both as a primary and secondary activity) is higher for working women compared with non-working women even if the difference is only a few percentage points (e.g. 92 per cent of non-working women and 95 per cent of working women).

To correctly interpret these results it is necessary to keep in mind that the definition of child care and adult care used in Table 4 refers to the whole care performed as primary or secondary activity, also including care performed outside the household.

Turning to time spent in child and adult care, women spend on average 48 minutes per day more than men in primary child care and about 20 minutes more than men in secondary child care. Women also spend 20 minutes more than men in secondary adult care but men spend only a few minutes more than women in primary adult care. The average higher time of men devoted to primary adult care is due to the higher amount of time (9 minutes) non-working men devoted to primary adult care compared to women.

It is interesting to note that even if the average minutes dedicated to adult care are much lower than those dedicated to child care, the overall participation rate in this activity is quite high and higher among non-working women and men.

Adult care is more equally distributed by gender, probably because each partner in a middle-aged couple has the burden of looking after his/her own elderly parents, since elderly parents may prefer to be looked after by their own children. This is even more so when males are retired.

Non-working women spend on average approximately 20 minutes more than working women in primary child care and approximately 10 minutes more in secondary child care. This suggests that not only do working women report a low participation in care but also that, those who participate, spend less time in care compared to non-working women. Primary adult care is more equally distributed among workers and non-workers but this is not the case of secondary adult care. The main difference is observed between working and non-working men, with non-working men spending 15 minutes more than working men in secondary adult care.

7 The uncounted value of care-giving in the Gross Domestic Product

The total value of unpaid family care work at national level depends on the number of people performing it, on the amount of time that each person devotes to this activity and on the value attributed to each unit of time. In the previous sections the time spent in child and adult care and the participation rate for each group has been discussed. In this section, in order to estimate the value of unpaid family care work we report the estimated unitary value of unpaid family care work (e.g. the value of one hour spent in care activities) and use it to compute the total national value of unpaid family care for the two countries. As discussed in Section 5 two methods are available to attributing a value to unpaid family care work: the opportunity cost method and the market replacement cost method. In this study the two methods are used to estimate the unpaid family care work in Poland and Italy. In order to make the results for Italy and Poland as comparable as possible we tried to use the same approach for the analysis in the two countries. However, since in the Polish Time Use Survey, differently from the Italian time use data, data on labour earnings are also collected, for Poland there is no need to use the matching procedure that was necessary in the case of the Italian analysis in order to match data on use of time and income. The results of the estimations are reported separately for Poland and Italy in the following subsections.

7.1 Poland

Table 5 summarises the participation rate and the average time spent in child and adult care and reports the Poland population involved in the two activities.

Table 5: Participation rates (%) and average minutes per day in child and adult care, by gender and work status of the population aged 18-74. Poland

	Women		Men	
	Working	Non-Working	Working	Non-Working
Participation rate in child care	35.2	29.6	27.8	16.7
Number of people who perform child care (millions)	2.02	2.01	2.03	0.74
Average time spent on primary child care (minutes per day)	108.5	145.4	73.6	89.2
Participation rate in adult care	4.2	4.8	2.4	3.4
Number of people who perform adult care (millions)	0.24	0.33	0.18	0.15
Average time spent on primary adult care (minutes per day)	31.9	41.5	30.3	46.2

Source: Polish Time Use Survey 2003/2004, authors elaborations

7.1.1 Opportunity cost

Table 6 summarises the results of the estimation. The total yearly value of unpaid family work equals to 8.29 billions of Euros (that is about 4,3 per cent of the Polish GDP of the reported period). More than 95 per cent of the estimated care value may be attributed to childcare. Almost three-quarters is a result of women's activity.

Table 6: Estimated Value of unpaid family care work with the opportunity cost approach (reference population: age 18-74; billions of Euros) - Poland

	Value of child care in one year	Value of adult care in one year	Total value of care in one year*
Women working	2.36	0.08	2.44
Women not working	3.06	0.14	3.2
Men working	1.77	0.06	1.83
Men not working	0.73	0.08	0.81
All women	5.42	0.23	5.65
All men	2.5	0.14	2.64
Total	7.92	0.37	8.29
% of GDP	4.1	0.2	4.3

Source: Polish Time Use Survey 2003/2004, authors elaborations.

7.1.2 Market replacement cost

As for the market replacement cost method two procedures has been used: The general market replacement cost method and the specialist market replacement method. As was already mentioned, the generalist market replacement approach aims at assigning a general household worker wage to

each hour of unpaid household work. The reference salary is exogenously assigned independently of the specific characteristics of households and individuals.

The wages of “Sales and services elementary occupation” (ISCO-88 code 91) has been used for Poland as proxy of the wage of general household worker. It includes, among other similar workers, the category “Domestic and related helpers, cleaners and launderers”. Consistently with the Italian analysis we use the average wage for household workers computed separately for men and women.

As might be expected, the total value of unpaid family work is significantly lower when estimated with the generalist market replacement method with respect to the opportunity cost method (the difference is equal to 16 per cent).

Table 7: stimated value of unpaid family care work with the generalist market replacement approach (reference population: age 18-74; billions of Euros) - Poland

	Value of child care in one year	Value of adult care in one year	Total value of care in one year*
Women working	1.89	0.07	1.96
Women not working	2.52	0.12	2.64
Men working	1.65	0.06	1.71
Men not working	0.73	0.08	0.81
All women	4.42	0.18	4.6
All men	2.37	0.14	2.51
Total	6.79	0.32	7.11
% of GDP	3.5	0.2	3.7

Source: Source: Polish Time Use Survey 2003/2004 authors elaborations.

Note: UFCW value based on the average net hourly earning of people in occupation ISCO-88 code 91

The detailed information on care activities available in the Polish time use survey allows us to deepen the analysis of the market replacement method by applying the specialist market replacement method. Instead of attributing the labour earnings of a general household worker, with this method it is possible to disaggregate total time spent on child activity into specific activities of different kinds. Childcare activity is described in a relatively detailed manner (physical care and supervision, helping children with homework, playing, reading, speaking to a child, going out with children, and other types of activity). Unfortunately, the Polish time use survey does not allow for disaggregation of activities related to adult care - there is only general information on intra and extra- household activity. However, since adult care has a rather marginal share in time allocation of the Polish population it does not seem to be a major drawback.

Each of the categories of care was matched with an ISCO-88 occupation classification code reported in the time use survey. The codes used are 51 (personal and protective services workers) for physical care and supervision of a child, and adult physical care; 23 (teaching professionals) for helping children with homework; 83 (drivers and mobile plant operators) for going out with children and 91 (sales and services elementary occupation) for other child care and child and adult care performed inside and outside the household. As for the generalist market replacement method and even for the specialist market replacement method we can impute the average labour earnings

of each occupation to the matched care activity.

Table 8: Estimated value of unpaid family care work with the specialist market replacement approach (reference population: age 18-74) - Poland

	Value of child care in one year	Value of adult care in one year	Total value of care in one year*
Women working	2.46	0.06	2.52
Women Non-Working	3.23	0.11	3.34
Men working	1.76	0.06	1.82
Men Non-Working	0.77	0.08	0.85
All women	5.69	0.17	5.86
All men	2.53	0.14	2.67
Total	8.22	0.31	8.53
Percentage of GDP (%)	4.2	0.2	4.5

Source: Polish Time Use Survey 2003/2004 authors elaborations

Note: UFCW value based on the average net hourly earnings of people in occupation by ISCO-88 codes 91-51-23-83

Taking into account the differences in labour earnings between different categories of workers that potentially could replace home-based care activity significantly increases the estimated value of unpaid family work. The child care dominates in the total value of unpaid care work with 96 per cent share in total value. Similarly to earlier estimations, the unpaid work undertaken by women is estimated to be of significantly higher value than in the case of men.

7.2 Italy

Table 9 summarises the participation rate and the average time spent in child and adult care and reports the Italian population involved in the two activities.

Table 9: Participation rates (%) and average minutes per day in child and adult care, by gender and work status (population aged 18-74) - Italy

	Women		Men	
	Working	Non-Working	Working	Non-Working
Participation rate in child care	32.4	23.6	22.6	8.2
Number of people who perform child care (millions)	2.69	2.93	2.93	0.54
Average time spent on primary child care (minutes per day)	116.5	134.8	76.5	86.6
Participation rate in adult care	9.5	13.3	7.3	15.1
Number of people who perform adult care (millions)	0.82	1.73	0.89	0.95
Average time spent on primary adult care (minutes per day)	60.2	66.1	55.3	75.4

Source: Multipurpose 2002/2003, authors elaborations.

Table 10: Estimated value of unpaid family care work with the opportunity cost approach (reference population: age 18-74; billions of Euros) - Italy

	Value of child care in one year	Value of adult care in one year	Total value of care in one year*
Working Women	24	3.6	27.6
Non-Working Women	27.2	7.7	34.9
Working Men	16.9	3.2	20.1
Non-Working Men	3.4	5.5	8.9
All Women	51.2	11.3	62.5
All Men	20.3	8.7	29
Total	71.5	20	91.5
Percentage of GDP (%)	4.8	1.3	6.1

Source: Multipurpose 2002/2003, authors elaborations.

7.2.1 The value of unpaid family care work in Italy with the opportunity cost method

Table 10 reports the value of child care in one year obtained multiplying the estimated value of each unit of unpaid work by the time spent in child care and by the number of people who perform child care in the country. In the same way, the value of adult care is obtained multiplying the estimated value of each unit of unpaid work by the time spent in adult care and by the number of people who perform adult care in the country. The procedure adopted to estimate the value of each unit of unpaid worked has been discussed in Section 5. The total value of unpaid family care work estimated using the opportunity cost approach is 91.5 billion Euros. Using the opportunity cost approach child care accounts for 78.1 per cent of the total value of unpaid family care work. Therefore, adult care, which is often ignored in the study on family care, with the 21.9 per cent, represents a not insignificant proportion of the total value of unpaid family care.

7.2.2 The value of unpaid family care work in Italy with the generalist market replacement method

The generalist market replacement method assigns as the unit value of unpaid family care work the hourly wages of unskilled workers in the service sector. In this study the wages of “Sales and services elementary occupation” (ISCO-88 code 91) which includes, among other similar workers, the category “Domestic and related helpers, cleaners and launderers” is used as proxy of the wage of a generalist domestic worker.

The value estimated with the generalist market replacement method is, as expected, lower than the value estimated using the opportunity cost method. Moreover, the proportion of the value of adult care on the total value of unpaid family care work is roughly the same as that derived with the opportunity cost approach (see Table 11).

Table 11: Estimated value of unpaid family care work with the generalist market replacement approach (reference population: age 18-74; billions of Euros) - Italy

	Value of child care in one year	Value of adult care in one year	Total value of care in one year*
Women working	19.9	3	22.9
Women Non-Working	26.2	7.4	33.6
Men working	13.3	2.5	15.8
Men Non-Working	2.9	4.4	7.3
All women	46.1	10.4	56.5
All men	16.2	6.9	23.1
Total	62.3	17.3	79.6
Percentage of GDP (%)	4.2	1.2	5.4

Source: Multipurpose 2002/2003, authors elaborations.

Note: UFCW value based on the average net hourly earning of people in occupation ISCO-88 code 91

7.3 The value of unpaid family care work in Italy with the specialist market replacement method

Table 12: Estimated value of unpaid family care work with the specialist market replacement approach (reference population: age 18-74) - Italy

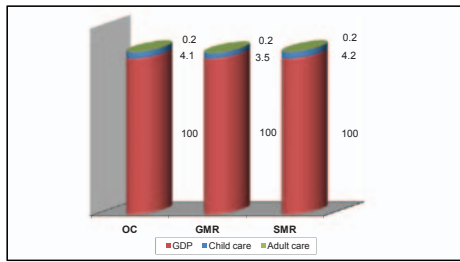
	Value of child care in one year	Value of adult care in one year	Total value of care in one year*
Women working	22.1	3.4	25.5
Women Non-Working	29.4	8.2	37.6
Men working	14.8	4	18.8
Men Non-Working	3.2	7.3	10.5
All women	51.5	11.6	63.1
All men	18	11.3	29.3
Total	69.5	22.9	92.4
Percentage of GDP (%)	4.7	1.5	6.2

Source: Multipurpose 2002/2003, authors elaborations.

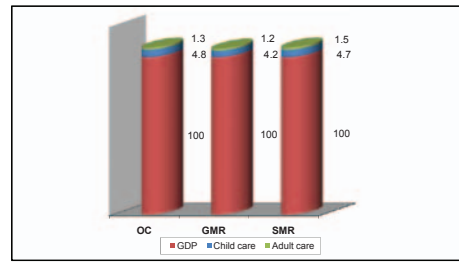
Note: UFCW value based on the average net hourly earnings of people in occupation by ISCO-88 codes 91-51-23-83

As in the Polish time use survey, detailed information on time use in the Multipurpose surveys enables the deepening of the analysis of the market replacement approach, applying the specialist market replacement method. In fact, rather than imputing the wage of a generalist domestic worker, it is possible to assign to each activity related to child care and adult care its own market wage. The Multipurpose survey collects information on the following child care activities: “Physical care”, “Supervision of child”; “Help children for homework”; “Play, read, talk with child”; “Transport of children”; and the following adult care activities: “Physical care”, “Company” “Transport” and “Other adult care activities”. Each of these categories of care is matched with an ISCO-88 occupation classification code reported in EU-SILC. The codes used are: 51 (Personal and protective services workers) for child physical care, supervision of a child, and adult physical care; 23 (Teaching professionals) for helping children with homework; 83 (Drivers and mobile plant operators) for transporting a child or an adult; 91 (Sales and services elementary occupation) for residual care activities and care performed outside the household.

Table 12 shows the estimated value of unpaid family care work matching by occupation. The estimated value is in line with that estimated with the opportunity cost method and the generalist



(a) Poland



(b) Italy

Figure 1: Estimated value of unpaid family care work - percentage of GDP(OC-GCR-SMR)

replacement cost method. The proportion of the value of adult care on the total value of unpaid family care work is, using the specialist replacement method, slightly lower than those observed using the opportunity cost method and the generalist replacement method (approximately 19 per cent against 21 per cent).

7.4 Comparison between Poland and Italy

Discussing the differences in the values of unpaid family care estimated for the two countries it is worth remarking that the determinants of the values of unpaid family care work are: (i) the number of people who spend time in unpaid family care, (ii) the time individuals devote to it, (iii) the value of each unit of time devoted to it. For simplicity here, all comparisons are based on the specialist market replacement method, since it represents an accurate way for evaluation, when data on labour income by occupation are available.

The comparison of the use of time in the two countries has shown that Italians participate somewhat less than Poles in child care, but substantially more in elderly care (around three times more). This has a demographic explanation, since the Polish population is younger than the Italian

population.

However, since Italy has a higher total population than Poland, the number of people performing both child and elderly care in Italy is higher. Given the higher female participation in child care the difference in the number of people performing child care in the two countries is mainly due to women: females performing care are 5.62 million in Italy and 4.03 million in Poland whereas males are 3.47 million in Italy and 2.77 in Poland. The figure is similar for the number of people performing adult care: females performing adult care are 2.55 million in Italy and 0.57 in Poland and males are 1.84 million in Italy and 0.33 million men in Poland.

As to the distribution of time of people who perform these activities, there are not significant differences in time spent in primary child care for both males and females (around two hours a day on average for females and one hour for males). As to elderly care, Poles spend around forty per cent less than Italians in this activity. However, since the average time allocated to elderly care activities is generally much lower than child care in both countries, there are not large differences in time allocated to total unpaid family care.

Finally, an important determinant of the total value of care is the value of each unit of care. The discrepancy in the hourly wages between Italy and Poland represents probably the main explanation of the difference in the value of unpaid family care work in the two countries. The average Polish wages are about one fifth of Italian wages. Understanding the determinants of this discrepancy is beyond the aim of this study. However, the different years of analysis (2003 for Poland, 2006 for Italy), the different purchasing power of the two currencies, the use of an exchange rate to convert the Polish value in Euros are probably among the main explanations of this discrepancy.

Taking into account these remarks, a mere comparison between the absolute values of unpaid family care work in Italy and Poland is meaningless not only because of the different population sizes, but also because the data on labour incomes in the two countries refer to two different years, 2003 for Poland and 2006 for Italy. Considering these caveats, it is useful to report the value of unpaid family work obtained with micro-data in percentage of GDP. The percentage of the unpaid family care work (net of taxation) on GDP is around 6.2 per cent in Italy and 4.5 per cent in Poland. 1 show that the percentage of the estimated value of the unpaid family care work on GDP is consistent using the three different methods and comparable between the two countries. The value of the child care in Poland goes from a minimum of 3.5 per cent of the GDP (GMR) to a maximum of 4.2 per cent of the GDP (SMR). The value of the child care in Italy are slightly higher reporting a minimum of 4.2 per cent of the GDP (GMR) and a maximum of 4.8 per cent (OC) of the GDP. The value of adult care is lower in Poland (almost 0.2 per cent of the GDP with the three methods) than in Italy (maximum 1.5 per cent (SMR)-minimum 1.2 per cent (GMR).

8 Conclusions

The advantages of the micro-data analysis conducted in this paper, compared to that usually performed for similar studies, are that using micro data it is possible to:

- better identify the population contributing to unpaid family care work (that is, by age, work status, day of the week, household characteristics);

- know precisely the time devoted to child care and elderly care. This last component is particularly important because, as seen in Section 2, there is growing interest in elderly care and no studies that estimate its value;
- better identify the value of each unit of unpaid family care work (hourly labour income) supplied by the population contributing to unpaid family care;
- use more sophisticated techniques to impute labour income to individuals observed in time use surveys (the so called “matching” of different surveys) in order to derive more reliable estimates.

The analysis enables to estimate the value of unpaid family care work in the two countries separately for child care and adult care.

The different years of analysis (2003 for Poland, 2006 for Italy), the different purchasing power of the two currencies, the use of an exchange rate to convert the Polish value in Euros may induce to think that the value of unpaid family care work estimated in the two countries were not comparable. However, the estimated value computed as percentage of the national GDP turns out to be not only comparable but also very similar. Italy shows a higher percentage of GDP in adult care than Poland, a result that is consistent with the fact that Italy has an older population.

Two further aspects might be remarked to the advantage of this approach. The first one is that data and methods adopted in this analysis allow to disentangle the determinants of the value of unpaid family care work in each country. The analysis has shown that the differences in the estimated value of unpaid family care work in the two countries are due to the proportion of the population involved in unpaid activities and the value of their time in the labour market, whereas the time spent in care-giving is roughly the same in the two countries. The second aspect to remark is that this analysis has allowed to estimate the weight of elderly care in the value of unpaid family work. This is particularly important in ageing societies. In fact, family elderly care is quite relevant in Italy, a country with a relatively older population compared to the rest of Europe. In Poland, elderly care turns out to be less prominent, also because of the younger population. Since the two countries are quite similar in terms of family care regimes, the estimated value of unpaid family elderly care should represent two similar regimes at different stages of ageing. This means that in perspective, for a deep understanding of the consequences of ageing, EU countries should place more attention on collecting data on elderly care, both paid and unpaid.

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