

Your Job or Your Folks? Working and Caring for Elderly Parents in Europe*

MANUEL V. MONTESINOS[†]

Universitat Autònoma de Barcelona
Barcelona School of Economics

October 27, 2022

[Download the latest version here](#)

Abstract

This paper studies the effect of the provision of care for elderly parents on labor supply decisions in Europe. Using data from the Survey of Health, Ageing and Retirement in Europe (SHARE), first I provide an overview of care provision and employment across the continent. In the second place, I estimate the effect of care provision on employment and hours worked through several reduced-form specifications. The results point out that, if any, caring for parents has a negative, small impact on the propensity to being employed and the number of hours worked. Next, I build and estimate a static, structural model which characterizes the trade-offs in terms of time allocation and care arrangements faced by a working-age individual with an elderly parent. I use the estimated model to simulate the decisions of individuals in my sample in several counterfactual scenarios where I remove differences across countries, and highlight the role of wages and prices of formal care to understand the observed patterns. Finally, I evaluate the effects of two policies in support of elderly care and discuss how these vary among the countries considered.

Keywords: elderly care, informal care, SHARE.

JEL Codes: D64, J14, J22.

*I am very grateful to Joan Llull for his continuous encouragement and support. I would also like to thank Elena T. Aguilar, Jacek Barszczewski, María Cabrera, Michael Creel, Annalisa Loviglio, Pau Milán, Hannes Mueller, Rubén Pérez Sanz, Augustin Tapsoba, and Katherina Thomas for many useful comments and suggestions.

[†]Departament d'Economia i d'Història Econòmica. Universitat Autònoma de Barcelona. Campus de Bellaterra – Edifici B, 08193, Bellaterra, Cerdanyola del Vallès (Barcelona), Spain. E-mail: manuel.montesinos@barcelonagse.eu.

I. Introduction

The age structure of the population in Europe is expected to change substantially in the coming decades. The ratio of people aged 65 or above to those aged 15 to 64 rose from 25% to 29.6% between 2010 and 2016, and is projected to reach 51.2% by 2070 (European Commission, 2018). Among the many implications of this demographic shift for the economy, the demand for elderly care is high and will likely increase in the future. Elderly care can be defined as the set of activities that aim to improve the quality of life of older adults who are not fully able to look after themselves because of terminal illness or physical and cognitive decline. This includes assistance with daily activities such as dressing, bathing, getting in and out of bed, or doing housework, among others (Clancy, Fisher, Daigle, Henle, McCarthy and Fruhauf, 2019). Elderly care is said to be *formal* when it is provided by means of paid, professional services in nursing homes or in the home of the care recipient, and *informal* when it is given by relatives, usually children and partners of the care recipient.

The ongoing demographic trends will likely put a strain on the institutions in charge of providing this kind of help and affect the way in which families meet the needs of their elderly. On the one hand, the purchase of formal care services places a burden on household finances, which may distort consumption and saving behavior. On the other hand, informal care can impose substantial costs in terms of time and foregone labor earnings on family members, given the commitment that caring activities entail. These costs are often in conflict with the willingness to provide care to parents, and should be accounted for in the evaluation of private and publicly-funded alternatives to support families with these needs. Thus, it is in the interest of policymakers to understand the role of elderly care in household decision-making.

In this context, the aim of this paper is twofold: first, to study the effect of the provision of care for elderly parents on the labor supply decisions made by working-age individuals; and second, to analyze if this effect differs across countries in Europe. European countries exhibit a substantial degree of heterogeneity with respect to the availability of public long-term care services. While Northern European countries spend almost 3% of their GDP on these services, Southern European countries devote around 1% of their GDP to them, with Central European countries falling in between (European Commission, 2019). Besides, family ties have been found to be weaker in Northern and Central European countries than in Southern countries (Reher, 1998; Kohli, Kunemund and Ludicke, 2005), where rates of cohabitation and the geographical closeness between older parents and their children are higher. These factors, together with differences in the degree of labor force attachment

and level of education across countries, have been associated with the existence of sizable differences in elderly care provision across European countries, documented by earlier research (Attias-Donfut, Ogg and Wolff, 2005; Crespo and Mira, 2014; Barczyk and Kredler, 2019). In particular, there is a strong North-South gradient in the utilization of informal care, which is more prevalent in Southern European countries than in Northern and Central European ones, while the gradient in formal care utilization is the opposite. These patterns might have important implications for the labor market outcomes of individuals with parents in need of care.

In this paper, I use data from the second wave of the Survey of Health, Ageing and Retirement in Europe (SHARE), a cross-national database which collects information about the living arrangements and socioeconomic characteristics of people aged 50 and older in a set of European countries. In the first place, I take advantage of the information available in the data to provide an overview of care provision across Europe, comparing the employment status of individuals who give informal care to their parents with those who do not. This preliminary analysis supports the hypothesis of a negative relation between taking care of older parents and labor supply, a link that seems stronger in Southern Europe than in the rest of the continent. While there are small differences in the employment status of caregivers compared to non-caregivers in Northern and Central Europe, caregivers in the South are 11% more likely to be non-employed than non-caregivers.

Secondly, I study the relationship between work and care in more detail by estimating several linear models where labor market outcomes are assumed to be explained by the provision of informal care. I carry out this exercise under the assumption that informal care decisions are exogenous first, and later consider the possibility that these are endogenous, using parental health and geographical proximity to parents as instruments. The estimation results obtained under the assumption of exogeneity point out that the effect of the number of hours of care on the propensity to be employed and the number of hours worked is negative and statistically significant, but small. Meanwhile, the effect of giving some care on these outcomes is not statistically different from zero. The effects estimated by the IV specifications are not significant either.

Next, I analyze care and work decisions jointly in a static, one-child-one-parent structural model. In this setup, a working-age individual who has a parent in need of care maximizes utility, defined over consumption, leisure, and the amount of care received by her parent, subject to budget, time, and care requirements constraints. This agent faces a number of trade-offs involving time allocation decisions, along with the choice between formal and informal care to meet her parent's

needs. I estimate this model for the whole sample, and also separately for women and men, and for Northern, Central and Southern Europe. The estimated model allows me to understand the forces driving the care and labor outcomes observed across countries. In order to do that, I simulate the behavior of the agents in my sample under three counterfactual scenarios where I remove differences in wages, prices of formal care, and preference parameters across country groups. As a result, I conclude that the observed disparities in care and labor supply decisions across countries are mostly explained by wages and prices of formal care.

Finally, I use the structural model to evaluate the effects of two policies in support of elderly care: a caregiver allowance for individuals with parents in need of care, and a discount in the price of formal care, both with the same cost for the government. In the first of these experiments, I find that agents substitute hours worked for hours of informal care in response to an increase in their non-labor income. In the second experiment, when the price of formal care falls, agents prefer to replace hours of informal care with formal care.

This paper contributes to the literature on aging and elderly care. In particular, there is a large number of studies that examine the impact of giving care to old parents on labor market outcomes. One of the main challenges in quantifying this effect is the potential endogeneity of care to labor supply decisions. The distribution of time between the two can be thought of as the outcome of a decision-making process which is influenced by several circumstances, such as the availability of formal care alternatives, or the presence of alternative sources of informal care among relatives of the care recipient. On top of that, some unobserved characteristics of the potential caregiver might be correlated with the propensity to work and give care. Although some studies in this body of the literature overlook this concern, others follow various strategies to correct for the potential bias in the estimation of the effect of interest. In the first of these two groups of studies, Carmichael and Charles (1998, 2003) find that giving informal care reduces the probability of being employed and the number of hours worked by individuals with parents in need of care in the United Kingdom. With the exception of Wolf and Soldo (1994), who find no effect on the probability of being employed or the number of hours worked in the US, studies belonging to the second group confirm that informal caregiving has negative consequences for labor market outcomes. That is the case of Ettner (1995, 1996), and Johnson and Lo Sasso (2000) for the US; Heitmueller (2007), and Michaud, Heitmueller and Nazarov (2010) for the United Kingdom; Casado-Marín, García-Gómez and López-Nicolás (2011) for Spain; Schmitz and Westphal (2017) for Germany; and Spiess and Schneider (2003), Viitanen (2005), Crespo (2008), Bolin,

Lindgren and Lundborg (2008), and Crespo and Mira (2014) for Europe. These last studies carry out cross-country comparisons and claim that the cost of providing informal care on labor outcomes vary across countries, being more adverse for women and caregivers in Southern Europe. I contribute to this strand of the literature by providing further evidence on the relation between elderly care and labor supply across countries in Europe, following a structural approach. This enables me to inspect the mechanisms behind these decisions, quantify their relevance in different countries, and compare the effects of policies in support of elderly care across the continent.

In this respect, my paper also contributes to the literature that develops and estimates structural models to address questions on aging and elderly care, such as Pezzin and Schone (1999), Byrne, Goeree, Hiedemann and Stern (2009), De Nardi, French and Jones (2010), Dobrescu and Iskhakov (2013), Dobrescu (2015), Skira (2015), Barczyk and Kredler (2018), Korfhage (2019), Mommaerts (2020), Ko (2021), and Barczyk, Fahle and Kredler (2022). The models proposed by these authors vary along multiple dimensions regarding dynamics, the number of decision makers and whether these interact or not, and the care and employment alternatives considered. In this paper, I opt for modeling the behavior of a working-age individual who makes decisions on consumption, hours worked and hours of formal and informal care to meet the needs of a parent in a static setting, focusing on the role that wages, prices of care, and preferences play in this choices in different countries. Most of the previous studies focus on the study of a single country (the United States or an European country), with the exception of Dobrescu and Iskhakov (2013) and Dobrescu (2015). While these two papers compare the saving behavior of the elderly across Europe, I concentrate on the association between the labor supply and care provision decisions of their children.

The rest of the paper is organized as follows. I present the data used and some descriptive evidence on care provision, employment and hours worked across Europe in Section II. I carry out the reduced-form analysis in Section III. I outline the structural model and discuss the estimation results, goodness of fit, and counterfactual simulations in Section IV. I show the simulation results of two policy experiments in Section V. I conclude in Section VI.

II. Data

In this paper, I use data from the Survey of Health, Aging and Retirement in Europe (SHARE). This is a longitudinal, cross-national database which collects detailed information about the living conditions of about 140,000 respondents aged

50 and older in 27 European countries. The seven biennial waves of SHARE which are currently available inform about demographics, labor status, physical and mental health, social support, housing, income and consumption at the individual and household level.

I target those respondents who are younger than 65, have not retired yet, and have at least one parent alive, so that they can face the trade-off between work and care for their elderly parents. There are two possible ways of using the information provided by SHARE to study this group of individuals. One is to focus on the potential caregivers, that is, respondents who are younger than 65 who provide information about their parents. The other is to concentrate on the potential care recipients, elderly parents who give information about their children. I use the first of these samples, since it allows to know more details about the characteristics of the potential caregivers, who are the decision-makers in my analysis. This sample also offers some information on the age, health status and closeness of residence of the parents of the potential caregivers.

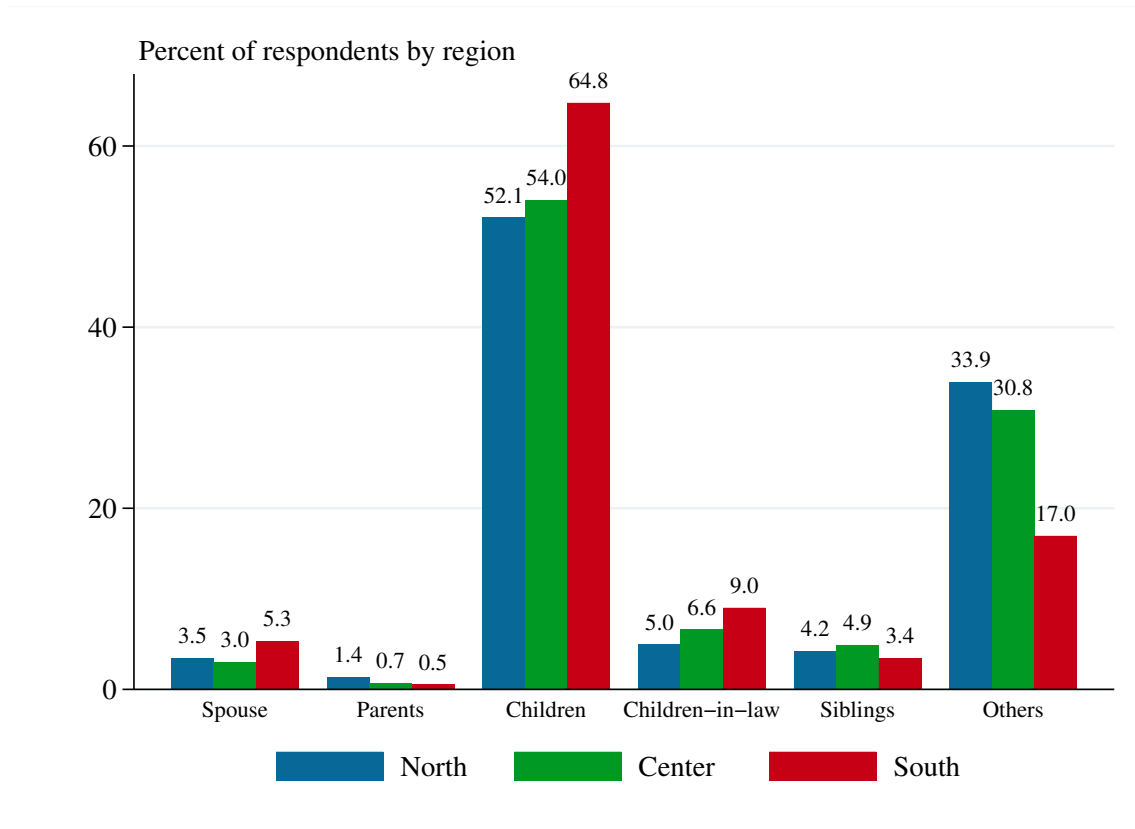
A. Elderly care

In my sample, I distinguish between informal care and formal care. An individual is considered to provide informal care if in the last twelve months she helped at least one of her parents with personal care (dressing, bathing or showering, eating, getting in or out of bed, using the toilet), practical household help (home repairs, gardening, transportation, shopping, household chores), or help with paperwork (filling out forms, settling financial or legal matters). I focus on care provided to parents by individuals aged 50 and older, since these constitute the most common source of informal care received by the elderly (see Figure 1).¹ Apart from the event of having provided some care, I keep record of the number of hours of care which the respondents give weekly (see Appendix A for more details). Because of the lack of information about the amount of time which respondents spend taking care of their parents after the second wave of SHARE, my analysis is restricted to the sample of individuals interviewed for Wave 2 between 2006 and 2007.

The measures of informal care that I use only comprise care given to parents who live outside the household. In the survey, respondents are also asked whether there is someone living in their household to whom they have helped regularly in the last twelve months with personal care, but there is no information about the

¹The choice of the group of individuals aged 50 and older as the target of study is also justified by the fact that the average difference between the age of parents and children in the second wave of SHARE is 26.9 years. Besides, 64.3% of the individuals who report receiving care from their children are older than 75 (see Figure B1).

FIGURE 1: SOURCES OF INFORMAL CARE RECEIVED BY PEOPLE AGED 70 AND OVER. SHARE WAVE 2



number of hours which they spend on it. In any case, the exclusion of co-residential care should not represent a major limitation, since only 1.1% of individuals in the sample report to have provided some.

Regarding formal care, in my sample this concept is defined as care in the form of professional or paid nursing home, personal care, help with domestic tasks and meals-on-wheels at home. I check whether the parents of the respondents received this kind of care, as well as for how many hours a week, and how much they paid out-of-pocket for these services. In SHARE, data on these variables are not referred to the parents of the respondents, but to respondents who demand this type of care to receive it themselves, so I use this information to impute a number of hours and expenditure on formal care for the parents of the respondents in my sample.²

Table 1 presents descriptive statistics on care provided to elderly parents by the individuals in my sample. It shows that, while 29% of respondents with at least one parent alive give some informal care, the prevalence of these activities varies substantially across countries. As documented by Attias-Donfut, Ogg and Wolff

²See Appendix A for a description of the procedure followed.

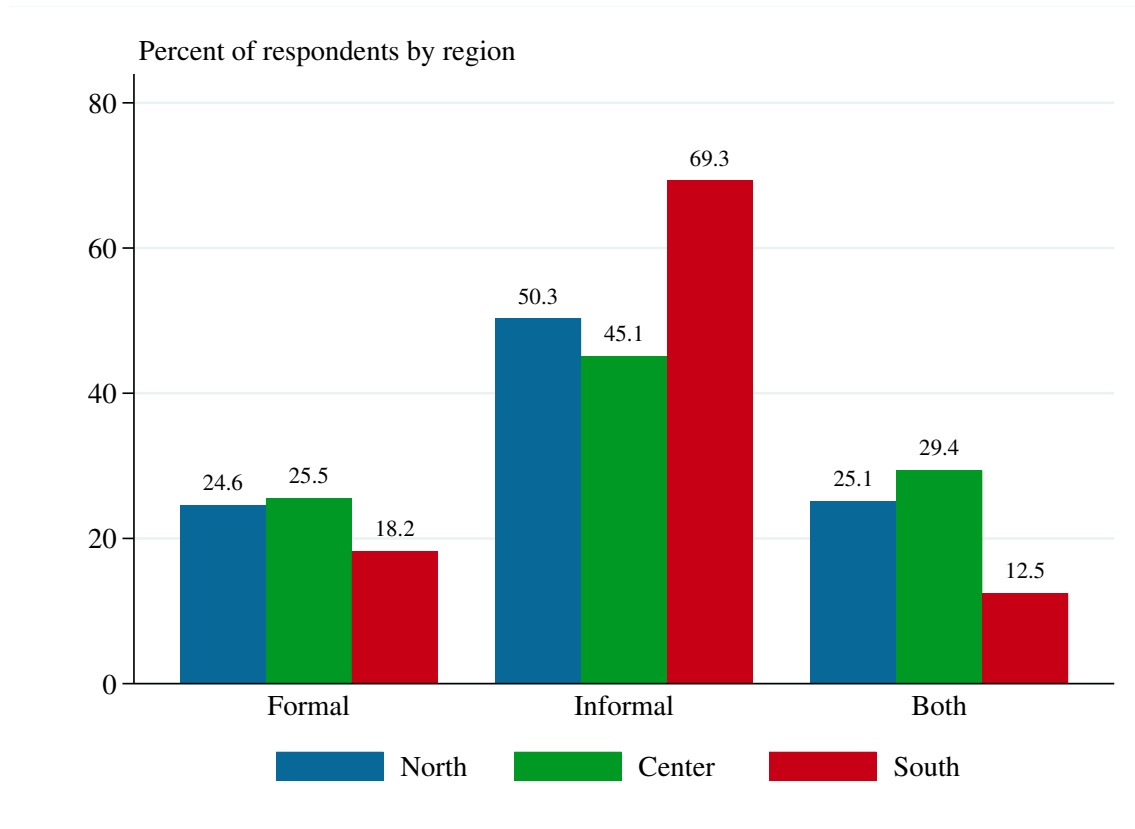
TABLE 1: DESCRIPTIVE STATISTICS ON INFORMAL CARE GIVEN TO PARENTS. INDIVIDUALS YOUNGER THAN 65 WITH AT LEAST ONE PARENT ALIVE. SHARE WAVE 2

Country	Obs.	Being a caregiver (dummy)		Hours of informal care (weekly) > 0	
		Mean	Std. Dev.	Mean	Std. Dev.
Austria	90	0.28	0.45	10.32	10.90
Belgium	510	0.36	0.48	5.77	11.40
Denmark	422	0.39	0.49	2.01	2.35
France	238	0.19	0.39	5.58	9.48
Germany	401	0.29	0.45	8.43	20.34
Greece	561	0.16	0.37	12.17	20.04
Italy	337	0.26	0.44	11.85	16.38
Netherlands	404	0.38	0.49	4.42	8.68
Spain	274	0.15	0.35	15.40	17.63
Sweden	432	0.40	0.49	3.13	5.13
Switzerland	323	0.28	0.45	4.46	10.27
Total	3,992	0.29	0.46	6.19	12.78

(2005), there seems to be a North-South gradient characterized by a large share of informal caregivers and a small amount of hours spent at giving care in northern countries (such as Sweden, with 40% of respondents giving some care at an average of 3.13 hours a week), and the opposite situation in southern countries (like Spain, with 15% of respondents being caregivers and an average of 15.4 hours of care a week).

Such heterogeneity in the use of informal care across Europe might be attributed to differences in norms, traditions and preferences which reflect in institutional features, such as the availability of publicly-funded formal care services and long-term care benefits. In fact, northern countries exhibit the highest shares of public expenditure on long-term care over GDP (from 2.6% in Denmark and the Netherlands to 2.9% in Sweden, according to Eurostat), whereas the countries in the South devote less resources to it (from 0.1% in Greece to 0.9% in Italy). In consequence, there is a remarkable discrepancy across countries in the “care mix” selected to meet the needs of the elderly population. As Figure 2 points out, the use of informal care as the only means of help for the elderly is more extended in the South of Europe (69.3% of respondents) than in the North (50.3%), while the share of individuals receiving both types of care is larger in the latter group than in the former.

FIGURE 2: TYPE OF CARE RECEIVED BY INDIVIDUALS AGED 70 AND OVER. SHARE WAVE 2



B. Employment

I focus on two labor-market outcomes: being in paid employment and the number of hours worked weekly.³ Table 2 presents descriptive statistics on these variables for individuals younger than 65 with at least one parent alive. 76% of individuals in the group under study reported being employed or self-employed at the time of the interview, a share that rises up to 95% in Sweden and goes down to 57% in Spain. Among the individuals who had a job, for whom the number of hours worked weekly was 38.2 on average, those living in southern countries like Spain were working over 41 hours a week, whereas in northern countries like Sweden this amount of time was around 38 hours.

With respect to the interaction between being a caregiver and working, it is relevant to know whether caregivers differ from non-caregivers in their employment rates and the amount of time they spend working. Panel A in Figure 3 compares the distribution of hours worked weekly across these two groups. The distribution

³See Appendix A for more details about their definition.

TABLE 2: DESCRIPTIVE STATISTICS ON EMPLOYMENT AND HOURS WORKED. INDIVIDUALS YOUNGER THAN 65 WITH AT LEAST ONE PARENT ALIVE. SHARE WAVE 2

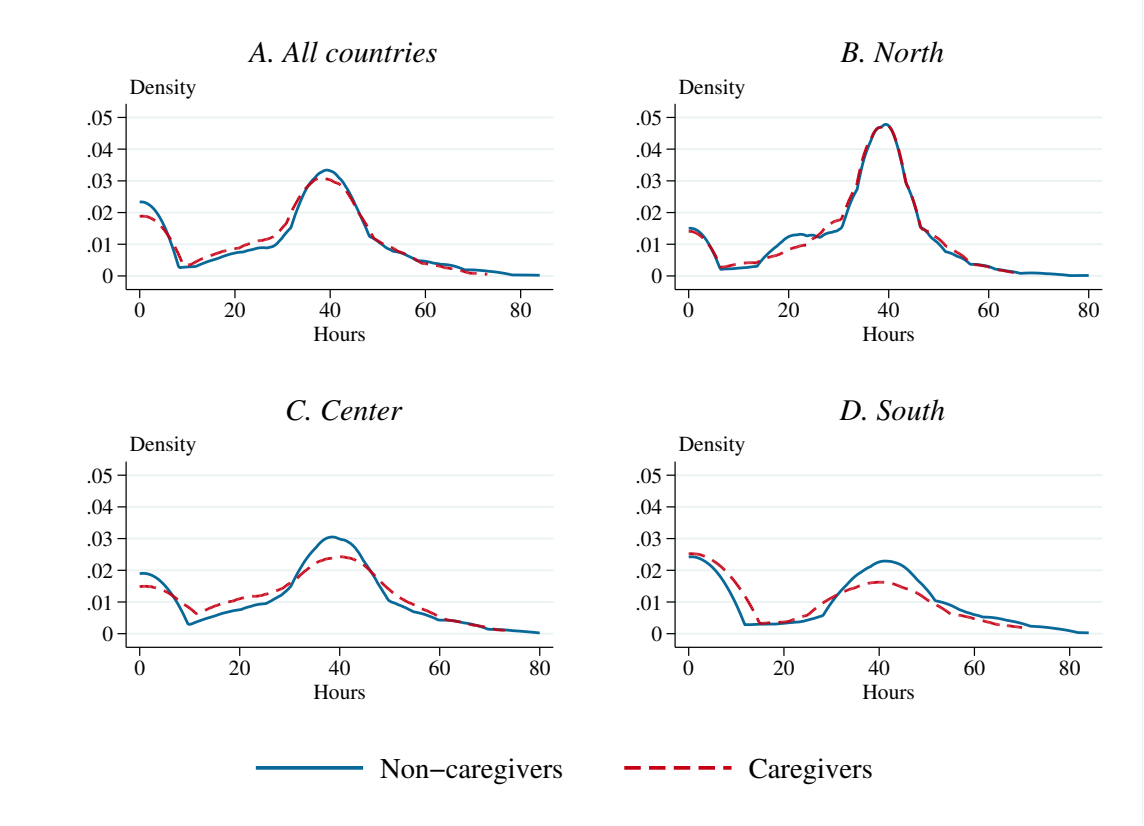
Country	Obs.	Being employed (dummy)		Hours worked (weekly) > 0	
		Mean	Std. Dev.	Mean	Std. Dev.
Austria	90	0.74	0.44	39.58	12.76
Belgium	510	0.72	0.45	37.33	12.52
Denmark	422	0.91	0.28	37.64	9.37
France	238	0.84	0.37	39.56	10.66
Germany	401	0.75	0.43	37.34	13.24
Greece	561	0.64	0.48	43.67	15.36
Italy	337	0.61	0.49	38.21	13.63
Netherlands	404	0.77	0.42	32.49	13.02
Spain	274	0.57	0.50	41.40	12.96
Sweden	432	0.95	0.22	38.53	10.46
Switzerland	323	0.84	0.3	36.95	15.287
Total	3,992	0.76	0.43	38.22	12.97

is slightly shifted to the left for caregivers with respect to the one of non-caregivers, though the mass of people who are not employed is lower among caregivers.

In connection with the aforementioned heterogeneity in the use of informal care and formal care across Europe, it seems pertinent to ask whether the high reliability on informal care in southern countries entails higher labor opportunity costs in this area than in the North of the continent. Panels B, C and D in Figure 3 and Figure 4 would be consistent with this hypothesis. As can be seen in the latter, whereas there is little variation between the employment status of caregivers with respect to non-caregivers in northern and central countries, the share of non-employed people living in the South is 11% higher for caregivers than for non-caregivers. This increase seems to be associated with a reduction of almost the same size in the share of full-time employed people. When the same comparison is carried out while accounting for gender as well, women in the South are the ones suffering the largest increase in non-employment rates from being caregivers, while the largest loss in full-time employment is suffered by men living in the same area (see Figure B2).

In sum, the descriptive evidence shown in this section suggests that there could be a negative relationship between labor supply and elderly care activities, as well as differences in the strength of this link and the costs it implies for caregivers across Europe. Of course, these results are merely indicative. In the next sections, I adopt a more rigorous approach to investigate the influence of caregiving on work decisions.

FIGURE 3: COMPARISON OF HOURS WORKED WEEKLY ACROSS COUNTRY GROUPS. NON-CAREGIVERS VS. CAREGIVERS. KERNEL DENSITY ESTIMATES. INDIVIDUALS YOUNGER THAN 65 WITH AT LEAST ONE PARENT ALIVE. SHARE WAVE 2



Note: The country groups represented are Northern Europe (Denmark, Netherlands and Sweden), Central Europe (Austria, Belgium, France, Germany and Switzerland) and Southern Europe (Greece, Italy and Spain).

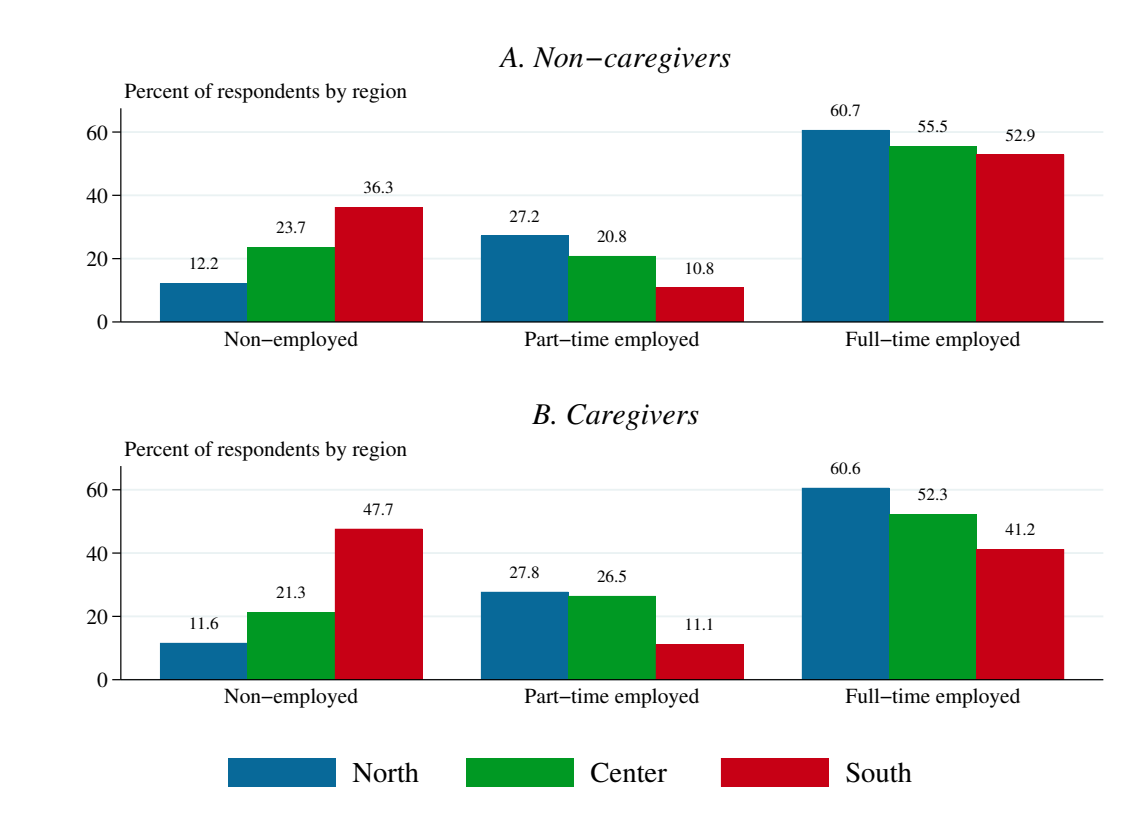
III. Reduced-Form Analysis

In this section, I explore the relevance of informal care provision as a factor explaining work decisions. For this purpose, I estimate linear regression models where labor market outcomes are assumed to be a function of parental care, socio-economic and demographic characteristics, and the institutional setting of the country of residence.⁴ Formally, I specify a relationship of the form

$$y_j = \alpha + \gamma i_j + x_j' \beta + \sum_k \delta_k c_j(k) + \epsilon_j, \quad (1)$$

⁴Although the analysis of binary outcomes such as being employed versus not being employed is usually carried out by discrete choice models (logit, probit, etc.), for the purpose of my study I rely on a linear probability model, since it can still serve as a guide to which regressors are statistically significant and the sign of their effects.

FIGURE 4: COMPARISON OF EMPLOYMENT STATUS ACROSS COUNTRY GROUPS. NON-CAREGIVERS VS. CAREGIVERS. INDIVIDUALS YOUNGER THAN 65 WITH AT LEAST ONE PARENT ALIVE. SHARE WAVE 2



where y_j is the labor market outcome of interest for individual j , α is a constant, i_j is a measure of informal care, x_j is a vector of socio-economic and demographic characteristics, $c_j(k)$ is a dummy equal to 1 if j lives in country k , and ϵ_j is the error term.⁵ This specification is run for two dependent variables: a dummy which equals 1 if the individual is employed or self-employed at the time of the interview, and 0 otherwise; and the number of hours worked weekly. As for informal care, I use two different regressors: a dummy which equals 1 if the individual is a caregiver, that is, she gives some care to an elderly parent, and 0 otherwise; and the number of hours of informal care which the individual gave weekly. Thus, I analyze how work and care decisions interact at the extensive and intensive margins.

The resulting four specifications include a set of controls for socio-economic and demographic characteristics: age and its square, number of years of education, total household income, a dummy for being married, and a dummy which equals 1 if the

⁵“Living in Austria” is set as base category.

individual is in bad health.⁶ When estimation is performed on the whole sample, a dummy for women is included. The regressions are also run for men and women, and for northern, central and southern countries separately.

Later, I compare the results obtained by following the above strategy with the ones achieved if the assumption of exogeneity between informal care and work is relaxed. As was explained previously, there might be some unobservable elements generating some degree of correlation between informal care and the error term which results in biased and inconsistent estimates of the coefficients of the model. In order to deal with endogeneity, I instrument informal care by using a dummy which takes value 1 if the health of at least one of the parents of the respondent is bad, and another dummy which equals 1 if at least one of the parents lives less than 25 km away.⁷ Both variables are supposed to be correlated with informal care, since worse parental health would increase the child's propensity to provide care, and similarly for a shorter distance between the residences of the parents and the child. Moreover, these variables should not affect labor market outcomes other than through its effect on informal care. As under the assumption of exogeneity, four IV specifications are run for the whole sample, men and women, and each country pool separately.

A. Results

Table 3 presents the results of the regressions of labor outcomes on informal care. Under the assumption of exogeneity, the number of hours of care has a negative, significant effect on the propensity to be employed and the number of hours worked in the whole sample and the subsample of women, though this effect is small: when the whole sample is considered, 10 more hours of care a week imply 0.68 hours worked less. The effect for men is not statistically different from zero at the 10% level. Meanwhile, when the dummy for giving some care to parents is used as a measure of informal care, the coefficient of this variable is not statistically different from zero in any of the samples.

In the IV specifications, the effect of informal care on labor outcomes is not statistically different from zero in any of the samples under study. This result does not seem to be driven by the choice of instruments, since the two that I use are both significant at the 5% level and have the expected positive impact on informal care

⁶See Table C1 for descriptive statistics on these variables.

⁷In the search for instruments, I also tried the number of siblings of the respondent and a dummy taking value 1 if the father and the mother of the respondent were deceased. After several trials with different combinations of the instruments, the one with parental health and distance to parental residence was selected based on strong instruments criteria.

TABLE 3: REGRESSIONS OF BEING EMPLOYED AND HOURS WORKED ON INFORMAL CARE. INDIVIDUALS YOUNGER THAN 65. SHARE WAVE 2

		Being employed (dummy)			Hours worked (weekly)		
		All	Women	Men	All	Women	Men
Hours of informal care (weekly)	OLS	-0.002**	-0.002***	-0.002	-0.068**	-0.057**	-0.127
		(0.001)	(0.001)	(0.003)	(0.031)	(0.025)	(0.124)
	IV	0.009	0.003	0.011	0.304	0.129	0.270
		(0.007)	(0.008)	(0.012)	(0.301)	(0.296)	(0.591)
Being a caregiver (dummy)	OLS	0.008	0.020	-0.004	0.369	1.219	-0.651
		(0.020)	(0.025)	(0.028)	(0.928)	(1.029)	(1.544)
	IV	0.081	0.025	0.088	2.812	1.190	2.120
		(0.060)	(0.071)	(0.100)	(2.709)	(2.763)	(5.185)
	N	9,193	5,315	3,878	9,193	5,315	3,878

Note: Robust standard errors in parenthesis. (*) Significance at 10% level. (**) Significance at 5% level. (***) Significance at 1% level. See Tables C3 and C4 for more details.

(see Table C2). Except for the number of hours of informal care in the subsamples of men and women, the F -test of joint significance of these instruments in the first-stage regressions is above the usual threshold of 10 below which there would be a weak instruments problem (Staiger and Stock, 1997).

In sum, these results suggest that, if any, caring for elderly parents has a small, negative effect on labor supply decisions made by working-age individuals.

B. Results by country groups

Table 4 presents the results of estimating the linear regression model for each country pool. In line with the hypothesis that informal care might have a large impact on the labor supply of Southern European individuals, the OLS specification yields a negative, significant effect of informal care on employment and hours worked weekly in this subsample. Compared to the other regions, the impact of providing some care to parents on hours worked is relatively large in the South, where the decision to become a caregiver is associated with a reduction of 3.6 hours worked weekly. Furthermore, the consequences of informal care on labor supply are greater for women than for men, for whom the estimates are not significant. Nevertheless, as in Table 3, the IV estimates are not statistically different from zero in any of the samples of Southern Europe.

For Northern and Central Europe, the coefficient estimates are not significant either when informal care is instrumented. As for the results of the OLS regressions, except for the impact of being a caregiver on hours worked by women in Central

TABLE 4: REGRESSIONS OF BEING EMPLOYED AND HOURS WORKED ON INFORMAL CARE. COMPARISON ACROSS COUNTRY GROUPS. INDIVIDUALS YOUNGER THAN 65. SHARE WAVE 2

		Being employed (dummy)			Hours worked (weekly)		
		All	Women	Men	All	Women	Men
		Norther Europe					
Hours of informal care (weekly)	OLS	-0.001 (0.002)	-0.000 (0.002)	0.003** (0.001)	-0.070 (0.051)	-0.011 (0.053)	0.015 (0.115)
	IV	0.023 (0.018)	0.037 (0.023)	-0.016 (0.021)	-0.036 (0.767)	0.426 (0.759)	-1.576 (1.340)
Being a caregiver (dummy)	OLS	0.018 (0.016)	0.025 (0.025)	0.009 (0.015)	0.399 (0.770)	0.650 (0.965)	0.198 (1.081)
	IV	0.061 (0.046)	0.100 (0.062)	-0.041 (0.056)	-0.313 (2.116)	0.941 (2.202)	-4.305 (3.466)
	N	2,892	1,628	1,264	2,892	1,628	1,264
		Central Europe					
Hours of informal care (weekly)	OLS	-0.002 (0.001)	-0.001 (0.001)	-0.003 (0.004)	-0.062 (0.062)	-0.025 (0.058)	-0.173 (0.171)
	IV	0.003 (0.008)	-0.000 (0.010)	0.004 (0.014)	0.057 (0.376)	0.179 (0.414)	-0.226 (0.678)
Being a caregiver (dummy)	OLS	0.035 (0.028)	0.065* (0.037)	-0.008 (0.040)	2.131 (1.431)	3.756** (1.611)	-0.234 (2.254)
	IV	0.029 (0.083)	-0.006 (0.103)	0.037 (0.136)	0.642 (3.788)	1.861 (4.041)	-2.325 (6.888)
	N	3,122	1,792	1,330	3,122	1,792	1,330
		Southern Europe					
Hours of informal care (weekly)	OLS	-0.002** (0.001)	-0.002*** (0.001)	-0.001 (0.004)	-0.065** (0.033)	-0.079*** (0.025)	-0.054 (0.224)
	IV	0.008 (0.012)	0.001 (0.011)	0.037 (0.028)	0.505 (0.534)	0.025 (0.420)	2.192 (1.452)
Being a caregiver (dummy)	OLS	-0.062* (0.038)	-0.059 (0.045)	-0.033 (0.062)	-3.599** (1.583)	-2.862* (1.586)	-3.544 (3.221)
	IV	0.116 (0.129)	0.014 (0.136)	0.344 (0.255)	6.878 (5.846)	-0.231 (5.180)	20.222 (13.655)
	N	2,701	1,635	1,066	2,701	1,635	1,066

Note: Robust standard errors in parenthesis. (*) Significance at 10% level. (**) Significance at 5% level. (***) Significance at 1% level. Northern Europe: Denmark, Netherlands and Sweden. Central Europe: Austria, Belgium, France, Germany and Switzerland. Southern Europe: Greece, Italy and Spain.

Europe, informal care does not appear to have a significant effect on the work decisions made by middle-aged people in these country groups.

IV. Structural Model

A. Setup

This section describes a one-child-one-parent model to study the link between informal care and labor supply in a more structured setting than in the linear regressions discussed before. Building on the neoclassical labor-leisure model, I consider a working-age individual who has an elderly parent and maximizes a single-period utility function,

$$\max_{\{c, l, n, i, f\}} U(c, l) + \delta V(i, f), \quad (2)$$

where c stands for consumption, l for leisure time, n for hours worked, i for hours of informal care given by the agent to her parent, and f for hours of formal care. The agent draws utility from consumption and leisure through function $U(\cdot)$, as well as from the amount of care, informal and formal, which her parent receives through function $V(\cdot)$. Both $U(\cdot)$ and $V(\cdot)$ are assumed to be continuous, twice continuously differentiable, strictly increasing and strictly concave. The degree to which the parent's welfare from receiving care matters to the agent depends on δ , a parameter which is assumed to take values between 0 and 1 and can be interpreted as a measure of altruism or the strength of the tie between the child and her parent.

The agent chooses her level of consumption, hours of formal care to buy in the market, and how to allocate her time to work, leisure and informal care. When making these decisions, the agent is constrained by the available monetary resources,

$$c + pf \leq y + wn, \quad (3)$$

where p is the price of one hour of formal care, w is the wage per hour worked, and y represents non-labor income. The price of the consumption good is normalized to 1.

The agent is also constrained by time.⁸ I assume that she has \bar{h} hours available to distribute among work, informal care, and leisure, which comprises all activities other than work and care for parents:

$$n + i + l = \bar{h}. \quad (4)$$

⁸Eventually, the total amount of time available to the agent is assumed to be 168 hours, that is, a whole week.

Besides, the parent has a certain amount of care requirements \bar{q} which the agent must meet by giving care herself or by buying hours of care in the market:

$$i + f \geq \bar{q}. \quad (5)$$

The agent is allowed to choose a combination of the two types of care, and to provide more hours of care than needed, but not less than \bar{q} .

Therefore, the agent faces a number of trade-offs. For each hour worked in the labor market, she is paid a wage which can be used together with non-labor income to buy consumption goods. However, one additional hour worked also implies one hour less of leisure or informal care. If the agent is willing to provide one hour of care less to her parent, she might consider to substitute that hour of informal care for one of formal care. Nonetheless, the corresponding expenditure on formal care implies a reduction in the amount of resources to buy consumption goods, and so on.

The agent maximizes utility over c , l , n , i , and f . The first-order conditions associated to the optimization problem are

$$\frac{\partial U}{\partial c} w = \frac{\partial U}{\partial l} \quad (6)$$

$$\delta \frac{\partial V}{\partial i} + \lambda = \frac{\partial U}{\partial l} \quad (7)$$

$$\delta \frac{\partial V}{\partial f} + \lambda = p \frac{\partial U}{\partial c}, \quad (8)$$

where λ is the Lagrange multiplier of the care constraint. I am interested in the case where λ is equal to 0, and so the care constraint is not binding, since in the data the total amount of care is usually larger than the minimum required. If this is the case,

$$\delta = \frac{\partial U / \partial l}{\partial V / \partial i} \quad (9)$$

$$p = \delta \frac{\partial V / \partial f}{\partial U / \partial c}. \quad (10)$$

Thus, the agent provides informal care up to the point in which the marginal utility derived from it equals the marginal utility of leisure. Then, δ is equal to the marginal rate of substitution between informal care and leisure. Furthermore, the agent buys hours of formal care up to the point in which the marginal utility derived from it equals the marginal utility of consumption. Hence, the ratio of p to δ turns out to be equal to the marginal rate of substitution between consumption and formal care.

The combination of (6), (9), and (10) delivers an additional result,

$$\frac{w}{p} = \frac{\partial V / \partial i}{\partial V / \partial f}, \quad (11)$$

according to which, the ratio of the wage to the price of formal care equals the marginal rate of substitution between the two types of care.

B. Identification and estimation

To work in the solution and estimation of the model, I assume that the objective function is log-linear, and set w , p , and δ as the parameters to estimate. Therefore, the model solved by agent j is

$$\begin{aligned} \max_{\{c_j, l_j, n_j, i_j, f_j\}} & \log(c_j) + \log(l_j - \bar{l}) + \delta \left[\log(1 + i_j + f_j - \bar{q}_j) + \log(1 + i_j) \right] \\ \text{s.t.: } & c_j + pf_j = y_j + wn_j \\ & n_j + i_j + l_j = \bar{h} \\ & i_j + f_j > \bar{q}_j, \end{aligned} \quad (12)$$

where \bar{l} represents the minimum amount of leisure which the agent must enjoy.⁹ In this specification, the agent does not only draw utility from providing more care than required, but also from providing some care herself. Then, although one hour of informal care can satisfy the same needs that one hour of formal care, the agent has some extra incentives to opt for the first alternative, maybe because her parent would prefer to receive the help needed from her child, or because the agent knows her parent's needs better than anyone else.¹⁰

As earlier explained, my sample contains data on hours worked, hours of care, and formal care expenditures, as well as on labor earnings, non-labor income, and hours of care required by parents. I estimate w , p and δ by GMM, using a set of

⁹The minimum leisure requirement is set to 88 hours weekly.

¹⁰This assumption would fit in with the notion of *procedural utility*, the idea that the agent does not only derive utility from the outcome of care, i.e., that her parent is properly cared for, but also from the *process* of caring for her parent. Prior studies have found evidence in support of this point (see, for instance, Brouwer, van Exel, van den Berg, van den Bos and Koopmanschap (2005)).

moment conditions derived from the solution of the model:

$$y_j + wn_j - pf_j = w(\bar{h} - n_j - i_j - \bar{l}) \quad (13)$$

$$\frac{y_j + wn_j - pf_j}{\bar{h} - n_j - i_j - \bar{l}} = p \left(1 + \frac{1 + i_j + f_j - \bar{q}_j}{1 + i_j} \right) \quad (14)$$

$$\frac{1}{\bar{h} - n_j - i_j - \bar{l}} = \delta \left(\frac{1}{1 + i_j + f_j - \bar{q}_j} + \frac{1}{1 + i_j} \right). \quad (15)$$

C. Estimation results and model fit

TABLE 5: ESTIMATES OF THE STRUCTURAL PARAMETERS. INDIVIDUALS YOUNGER THAN 65. SHARE WAVE 2

	All	Women	Men	Women = Men (χ^2)
w	12.960 (0.617)	10.916 (0.909)	16.522 (0.597)	26.56 [0.000]
p	8.028 (0.420)	6.148 (0.555)	10.490 (0.609)	27.79 [0.000]
δ	0.014 (0.000)	0.011 (0.000)	0.018 (0.000)	108.15 [0.000]
N	8342	4862	3480	

Note: Robust standard errors in parenthesis. P -value of the test of equality of coefficients between women and men in square brackets.

Table 5 displays the parameter estimates for the whole sample and for women and men separately, while Table 6 does the same for the three country pools considered. The estimates are reasonable, ranging from 6.9 for w and 4.1 for p in the sample of women from Southern Europe, to 20.2 and 12 in the sample of Northern European men.

The tables also report the results of the test of equality between women and men for each parameter. The fact that w and p take different values for women than for men does not necessarily mean that there exists wage or price discrimination in the sample. Rather, this discrepancy may come from the parametrization of the model. Apart from wages and prices of formal care, w and p may be capturing preference related aspects in the absence of more parameters in the utility function. Similarly, δ may be reflecting some additional information to family ties. Indeed, there are two aspects involved in the term of the objective function where this parameter is present: how much the agent values that her parent is well taken care of, and how much she values to give care herself. Perhaps, individuals in the sample appreciate

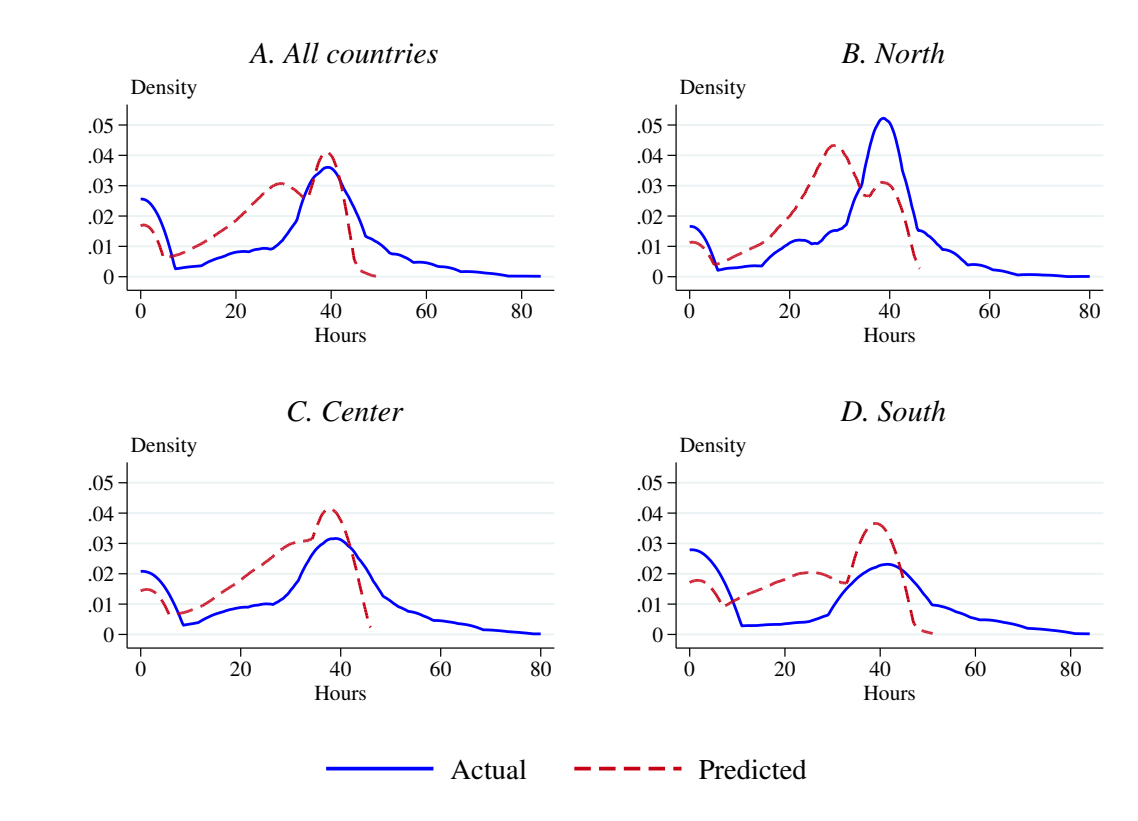
TABLE 6: ESTIMATES OF THE STRUCTURAL PARAMETERS ACROSS COUNTRY GROUPS. INDIVIDUALS YOUNGER THAN 65. SHARE WAVE 2

Northern Europe					Central Europe					Southern Europe				
	All	Women	Men	Women =	All	Women	Men	Women =	All	Women	Men	Women =		
				Men (χ^2)				Men (χ^2)				Men (χ^2)		
w	16.352 (0.356)	13.818 (0.405)	20.149 (0.626)	72.03 [0.000]	15.886 (1.242)	14.065 (1.960)	18.728 (0.875)	4.72 [0.030]	8.535 (0.397)	6.837 (0.313)	12.085 (1.037)	23.47 [0.000]		
p	8.811 (0.705)	6.501 (0.831)	12.017 (0.812)	22.56 [0.000]	9.413 (0.744)	7.643 (1.100)	11.417 (0.947)	6.76 [0.009]	5.714 (0.449)	4.143 (0.404)	8.212 (0.929)	16.12 [0.000]		
δ	0.015 (0.000)	0.013 (0.000)	0.017 (0.000)	53.01 [0.000]	0.015 (0.001)	0.012 (0.001)	0.018 (0.001)	37.07 [0.000]	0.013 (0.000)	0.010 (0.000)	0.017 (0.001)	63.94 [0.000]		
N	2,766	1,563	1,203		2,960	1,704	1,256		2,616	1,595	1,021			

Note: Robust standard errors in parenthesis. P -value of the test of equality of coefficients between women and men in square brackets.

the fact that their parents receive care, but not much being the providers of such care, or the other way round. This might be the reason why the estimate of δ is small.

FIGURE 5: COMPARISON OF HOURS WORKED WEEKLY ACROSS COUNTRY GROUPS. ACTUAL VS. PREDICTED. KERNEL DENSITY ESTIMATES. INDIVIDUALS YOUNGER THAN 65 WITH AT LEAST ONE PARENT ALIVE. SHARE WAVE 2



To examine the model fit, I plug the parameter estimates into the model and predict hours worked, hours of informal care, and hours of formal care for each individual in my sample. Table 7 compares the predictions for individuals younger than 65 with the actual magnitudes in the data. Figure 5 concentrates on the distribution of hours worked weekly.

In general, the model overpredicts the employment rate and the share of part-time work, especially in Northern Europe, where the mode of the distribution of hours worked is not 40, as in the other two regions. The model also predicts that all individuals provide some amount of informal care to parents, but the low estimate of δ leads them to spend fewer hours taking care of them than those observed in the sample. By contrast, the model slightly overpredicts the share of individuals

TABLE 7: OBSERVATIONS VS. PREDICTIONS BY THE STRUCTURAL MODEL. MEANS FOR INDIVIDUALS YOUNGER THAN 65 WITH AT LEAST ONE PARENT ALIVE. SHARE WAVE 2

	Being employed (dummy)		Hours worked (weekly) > 0		Being a caregiver (dummy)		Hours of informal care (weekly) > 0		Use of formal care (dummy)		Hours of formal care (weekly) > 0	
	Actual	Predicted	Actual	Predicted	Actual	Predicted	Actual	Predicted	Actual	Predicted	Actual	Predicted
North	0.88 (0.01)	0.94 (0.01)	36.82 (0.32)	29.08 (0.27)	0.40 (0.01)	1.00 (0.00)	3.20 (0.28)	1.24 (0.02)	0.78 (0.01)	0.98 (0.00)	2.99 (0.29)	2.68 (0.13)
Center	0.77 (0.01)	0.91 (0.01)	38.07 (0.40)	29.71 (0.30)	0.30 (0.01)	1.00 (0.00)	6.58 (0.61)	1.57 (0.06)	0.78 (0.01)	0.93 (0.01)	2.86 (0.26)	2.34 (0.10)
South	0.61 (0.01)	0.86 (0.01)	41.77 (0.56)	30.11 (0.45)	0.19 (0.01)	1.00 (0.00)	13.27 (1.30)	1.75 (0.05)	0.81 (0.01)	0.63 (0.01)	3.08 (0.34)	2.77 (0.15)
All	0.76 (0.01)	0.90 (0.00)	38.42 (0.24)	29.56 (0.19)	0.30 (0.01)	1.00 (0.00)	6.40 (0.37)	1.46 (0.03)	0.79 (0.01)	0.86 (0.01)	2.95 (0.17)	2.55 (0.07)

Note: Standard errors in parenthesis. The standard error of the prediction does not take into account the error in the estimation of the coefficients.

who use formal care, whereas the number of hours chosen is close to that in the data. Therefore, in the environment described by this model, the agents' incentives to substitute hours worked for hours of informal care are not as strong as they seem to be in the sample.

For a better understanding of the results, Figure B3 plots the predicted distribution of hours worked by women and men. Here we can see that the model finds the greatest difficulties at explaining the behavior of Northern European men. The predicted distribution of hours worked is shifted to the left for women and men, but for this group the probability mass accumulated around 40 hours is much higher in the data.

D. Counterfactual simulations

Further examination of the parameters driving the predictions in the country groups is convenient. Table 8 compares the predictions discussed above with the ones obtained under three counterfactuals: one in which the wage parameters of Central and Southern Europe take the same value than in Northern Europe; another one in which, apart from w , p is made equal to the estimated price in the North; and another one in which also δ takes the same value in the three country pools. As the outcome of this exercise shows, the greatest differences between the baseline predictions and the counterfactuals emerge in the South and seem to be mostly explained by wage and formal care price differentials. For example, under the first counterfactual there is a 22.3% difference in hours worked with respect to the baseline prediction. This difference goes down to 21.9% after p is fixed in the second counterfactual, and decreases to 21.6% in the last one.

V. Policy Experiments

In the model discussed above, care and work are presented as two competing alternatives in the agent's time allocation problem. Once the minimum leisure and care requirements are met, one more hour of informal care for parents yields utility to the agent, but implies one hour less of paid work, and so a loss in terms of foregone wages. As a consequence, working-age individuals with elderly parents may struggle to combine their role as caregivers with work, giving place to an unsatisfactory distribution of time between these two activities. The willingness to help overcome this trouble has motivated the implementation of policies targeting family carers. As such, many countries have taken action to reduce the dual pressure from work and care by introducing flexible work schedules, counseling services, or cash benefits for

TABLE 8: DECOMPOSITION OF REGIONAL DIFFERENCES IN THE OUTCOMES PREDICTED BY THE STRUCTURAL MODEL. MEANS FOR INDIVIDUALS YOUNGER THAN 65 WITH AT LEAST ONE PARENT ALIVE. SHARE WAVE 2

	Being employed (dummy)		Hours worked (weekly) > 0		Being a caregiver (dummy)		Hours of informal care (weekly)>0		Use of formal care (dummy)		Hours of formal care (weekly)> 0	
	Baseline	Counterf.	Baseline	Counterf.	Baseline	Counterf.	Baseline	Counterf.	Baseline	Counterf.	Baseline	Counterf.
Same w than Northern Europe												
Center	0.91 (0.01) [0.00%]	0.91 (0.01) [0.00%]	29.09 (0.26) [1.27%]	29.46 (0.26) [0.00%]	1.00 (0.00) [0.00%]	1.00 (0.00) [0.00%]	1.51 (0.03) [-5.96%]	1.42 (0.02) [2.15%]	0.93 (0.01) [2.15%]	0.95 (0.01) [0.40%]	2.52 (0.10) [0.40%]	2.53 (0.10) [0.40%]
South	0.86 (0.01) [11.63%]	0.96 (0.01) [0.00%]	28.53 (0.35) [22.29%]	34.89 (0.18) [0.00%]	1.00 (0.00) [-66.00%]	0.34 (0.01) [0.00%]	2.96 (0.12) [-62.84%]	1.10 (0.03) [58.73%]	0.63 (0.01) [58.73%]	1.00 (0.00) [46.33%]	3.00 (0.15) [46.33%]	4.39 (0.16) [46.33%]
Same w and p than Northern Europe												
Center	0.91 (0.01) [0.00%]	0.91 (0.01) [0.00%]	29.09 (0.26) [1.75%]	29.60 (0.26) [0.00%]	1.00 (0.00) [0.00%]	1.00 (0.00) [0.00%]	1.51 (0.03) [-13.91%]	1.30 (0.02) [4.30%]	0.93 (0.01) [4.30%]	0.97 (0.00) [0.79%]	2.52 (0.10) [0.79%]	2.54 (0.10) [0.79%]
South	0.86 (0.01) [11.63%]	0.96 (0.01) [0.00%]	28.53 (0.35) [21.87%]	34.77 (0.18) [0.00%]	1.00 (0.00) [-1.00%]	0.99 (0.00) [0.00%]	1.86 (0.05) [-40.86%]	1.10 (0.02) [52.38%]	0.63 (0.01) [52.38%]	0.96 (0.01) [10.67%]	3.00 (0.15) [10.67%]	3.32 (0.16) [10.67%]
Same w, p and δ than Northern Europe												
Center	0.91 (0.01) [0.00%]	0.91 (0.01) [0.00%]	29.09 (0.26) [1.82%]	29.62 (0.26) [0.00%]	1.00 (0.00) [0.00%]	1.00 (0.00) [0.00%]	1.51 (0.03) [-14.57%]	1.29 (0.02) [4.30%]	0.93 (0.01) [4.30%]	0.97 (0.00) [0.79%]	2.52 (0.10) [0.79%]	2.54 (0.10) [0.79%]
South	0.86 (0.01) [11.63%]	0.96 (0.01) [0.00%]	28.53 (0.35) [21.59%]	34.69 (0.18) [0.00%]	1.00 (0.00) [0.00%]	1.00 (0.00) [0.00%]	1.85 (0.05) [-37.84%]	1.15 (0.02) [52.38%]	0.63 (0.01) [52.38%]	0.96 (0.01) [10.67%]	3.00 (0.15) [10.67%]	3.32 (0.16) [10.67%]

Note: For each variable, column *baseline* refers to the prediction under region-specific parameters, and column *counterf.* to the prediction in the counterfactual scenario where the parameters take the same value than in Northern Europe. Standard errors in parenthesis. The standard error of the prediction does not take into account the error in the estimation of the coefficients. Difference between baseline and counterfactual predictions in square brackets.

caregivers and care recipients (Colombo, Llena-Nozal, Mercier and Tjadens, 2011).

In this section, I use the model in Section IV to study how government sponsored policies in support of elderly care might affect individual labor supply and care provision decisions. In particular, I evaluate the impact of two policies with the same total cost: a weekly €102.7 caregiver allowance for people whose parents need care, and a 80% discount in the price of formal care.¹¹

A. Caregiver allowance

As a first policy experiment, I investigate how agents with parents in need of care would react if they were compensated for the potential costs of caring by means of a caregiver allowance. A caregiver allowance acknowledges that taking care of the elderly entails some costs for which caregivers should be compensated, rewarding their effort and the social role they play. Countries where these payments to caregivers have been implemented exhibit a variety of compensations schemes and eligibility conditions (Colombo, Llena-Nozal, Mercier and Tjadens, 2011). I simulate the effects of giving all individuals with parents in need of help a transfer of €102.7 a week. In this way, all potential caregivers are treated the same, so there might be cases in which this amount is not enough to cover all the costs of care provision, and others in which, by contrast, the allowance exceeds one's needs by far. Payment is made conditional upon the presence of a parent with help needs. Neither employment status, nor income, nor any other circumstances matter in this version of the policy.

Table 9 compares the outcomes of the allowance with the model predictions under no policy. With respect to the baseline, there is a slight decrease in the employment rate and the shares of formal and informal care users overall. At the same time, when the whole sample is considered, hours worked are reduced by 13% and hours of informal care rise by more than 6%. These effects are stronger in Southern Europe, where the decrease in hours worked doubles the one in the other regions, and the share of formal care users drops by 11%, while it barely changes in Northern and Central Europe.

Therefore, this exercise suggests that, when potential caregivers are supported by an external source of non-labor income, they tend to reduce the amount of time spent at work and give some extra attention to their parents, instead of using the money to buy more formal care. This underscores once again the conflict between work and family care responsibilities, along with the preference of the agents for

¹¹Using the observations in my sample and the number of people which they represent according to sampling weights, the total cost of both policies would be €1.858 billion.

TABLE 9: RESULTS OF THE CAREGIVER ALLOWANCE ON EMPLOYMENT AND ELDERLY CARE. MEANS FOR INDIVIDUALS YOUNGER THAN 65 WITH AT LEAST ONE PARENT ALIVE. SHARE WAVE 2

	Being employed (dummy)		Hours worked (weekly) > 0		Being a caregiver (dummy)		Hours of informal care (weekly)>0		Use of formal care (dummy)		Hours of formal care (weekly)> 0	
	Baseline	Policy	Baseline	Policy	Baseline	Policy	Baseline	Policy	Baseline	Policy	Baseline	Policy
North	0.94 (0.01) [-2.13%]	0.92 (0.01)	28.90 (0.25) [-10.73%]	25.80 (0.25)	1.00 (0.00) [0.00%]	1.00 (0.00)	1.20 (0.01) [5.00%]	1.26 (0.01)	0.97 (0.00) [0.00%]	0.97 (0.00)	2.98 (0.12) [0.00%]	2.98 (0.12)
Center	0.91 (0.01) [-2.20%]	0.89 (0.01)	29.56 (0.25) [-10.72%]	26.39 (0.25)	1.00 (0.00) [0.00%]	1.00 (0.00)	1.51 (0.03) [6.62%]	1.61 (0.03)	0.93 (0.01) [-1.08%]	0.92 (0.01)	2.53 (0.10) [-0.40%]	2.52 (0.10)
South	0.86 (0.01) [-3.49%]	0.83 (0.01)	29.67 (0.33) [-20.02%]	23.73 (0.32)	1.00 (0.00) [0.00%]	1.00 (0.00)	1.85 (0.05) [8.65%]	2.01 (0.05)	0.63 (0.01) [-11.11%]	0.56 (0.01)	3.24 (0.17) [-2.16%]	3.17 (0.17)
All	0.90 (0.00) [-2.22%]	0.88 (0.00)	29.37 (0.16) [-13.31%]	25.46 (0.16)	1.00 (0.00) [0.00%]	1.00 (0.00)	1.51 (0.02) [6.62%]	1.61 (0.02)	0.85 (0.01) [-2.35%]	0.83 (0.01)	2.84 (0.07) [-0.70%]	2.82 (0.07)

Note: Standard errors in parenthesis. The standard error of the prediction does not take into account the error in the estimation of the coefficients. Difference between baseline and policy in square brackets.

informal care over formal care when additional income is made available to them.

B. Formal care price subsidy

An alternative to transfers paid directly to caregivers is to subsidize the price of formal care services. By doing so, instead of giving agents additional resources which they can freely allocate to satisfy their needs, the government can foster the substitution of informal care for formal care, and so help people not to give up work if they want to take care of their parents. The policy that I study in this section is a government-financed 80% discount in the price of formal care. I assume that this discount applies to all individuals in my sample, and it is not contingent on individual circumstances such as income, employment status, or level of care needs.

Table 10 compares the outcomes of the subsidy with the predictions made in the baseline scenario. In contrast to the caregiver allowance, the price subsidy has a negligible effect on the employment rate and hours worked. The impact of the policy is concentrated on the choice of care arrangements. There happens to be a 76% reduction in the share of informal care users, and a 18% increase in the share of formal care users. In the intensive margin, we can appreciate a decrease of around 57% in the number of hours of informal care, whereas the amount of formal care is more than three times larger under the policy than in the baseline. The change of the status quo seems to be greater in Southern Europe, where the share of formal care users grows much more (59%) than in the other two regions, and the number of hours of formal care increases by 169%.

All in all, the policy evaluation exercises carried out in this section teach us two lessons: first, that work and informal care do compete as two alternative uses of time; and second, that depending on the targeted care mix, public authorities will be interested in implementing one particular policy or another. If they prefer informal caregivers to give as much care as possible, resources will be better transferred directly to them, so that they have incentives to replace hours worked with hours of informal care. If, on the contrary, the aim of policymakers is to help individuals not reduce their labor supply when facing care responsibilities, a formal care price subsidy can induce agents to substitute informal care for formal care services.

VI. Conclusion

This paper studies the interaction between the decision to provide care to elderly parents and the employment status of middle-aged individuals, using the second wave of the Survey of Health, Aging and Retirement in Europe. The analysis of

TABLE 10: RESULTS OF THE FORMAL CARE PRICE SUBSIDY ON EMPLOYMENT AND ELDERLY CARE. MEANS FOR INDIVIDUALS YOUNGER THAN 65 WITH AT LEAST ONE PARENT ALIVE. SHARE WAVE 2

	Being employed (dummy)		Hours worked (weekly) > 0		Being a caregiver (dummy)		Hours of informal care (weekly)>0		Use of formal care (dummy)		Hours of formal care (weekly)> 0	
	Baseline	Policy	Baseline	Policy	Baseline	Policy	Baseline	Policy	Baseline	Policy	Baseline	Policy
North	0.94 (0.01) [0.00%]	0.94 (0.01) [0.00%]	28.54 (0.26) [0.63%]	28.72 (0.25) [0.63%]	1.00 (0.00) [-79.00%]	0.21 (0.01) [0.00%]	1.99 (0.04) [-48.24%]	1.03 (0.01) [3.09%]	0.97 (0.00) [3.09%]	1.00 (0.00) [3.09%]	2.98 (0.12) [234.90%]	9.98 (0.13) [234.90%]
Center	0.91 (0.01) [0.00%]	0.91 (0.01) [0.00%]	29.09 (0.26) [1.55%]	29.54 (0.26) [1.55%]	1.00 (0.00) [-73.00%]	0.27 (0.01) [0.00%]	2.54 (0.07) [-55.51%]	1.13 (0.03) [7.53%]	0.93 (0.01) [7.53%]	1.00 (0.00) [7.53%]	2.52 (0.10) [249.60%]	8.81 (0.11) [249.60%]
South	0.86 (0.01) [1.16%]	0.87 (0.01) [1.16%]	28.53 (0.35) [2.07%]	29.12 (0.34) [2.07%]	1.00 (0.00) [-77.00%]	0.23 (0.01) [0.00%]	3.41 (0.18) [-63.93%]	1.23 (0.06) [58.73%]	0.63 (0.01) [58.73%]	1.00 (0.00) [58.73%]	3.00 (0.15) [168.67%]	8.06 (0.18) [168.67%]
All	0.90 (0.00) [1.11%]	0.91 (0.00) [1.11%]	28.75 (0.17) [1.39%]	29.15 (0.16) [1.39%]	1.00 (0.00) [-76.00%]	0.24 (0.01) [0.00%]	2.63 (0.06) [-57.03%]	1.13 (0.02) [17.65%]	0.85 (0.01) [17.65%]	1.00 (0.00) [17.65%]	2.79 (0.07) [225.09%]	9.07 (0.08) [225.09%]

Note: Standard errors in parenthesis. The standard error of the prediction does not take into account the error in the estimation of the coefficients. Difference between baseline and policy in square brackets.

European data reveals the existence of remarkable differences across countries in the way in which elderly care needs are met, with informal care being more prevalent in Southern Europe than in the rest of the continent. Such heterogeneity could have relevant implications for the labor market outcomes of elderly care in the regions under study. While there are little differences in this respect between caregivers and non-caregivers in Northern and Central Europe, caregivers from the South are 11% more likely to be non-employed than otherwise similar non-caregivers.

To inspect the relevance of informal care provision for labor supply decisions, I estimate linear regression models of labor market outcomes on informal care, controlling for socioeconomic and demographic characteristics, and institutional features of the country of residence. This exercise is first carried out under the hypothesis of exogeneity between work and informal care, and later assuming that they are endogenous. The results suggest that, if any, caring for elderly parents has a negative, small impact on the likelihood of being employed and the number of hours worked.

I further explore the link between labor supply and elderly care by specifying a one-child-one-parent static structural model. This model represents a working-age individual maximizing utility, defined over consumption, leisure, and the amount of care received by her parent, and subject to budget, time and care requirements constraints.

The estimated model allows me to explore the drivers behind the different care and labor outcomes observed across countries. After simulating the decisions of the agents in my sample in three counterfactual scenarios that equal wages, prices of formal care, and preference parameters across country groups, I conclude that the aforementioned differences are mostly explained by the first two factors. Next, I use the model to evaluate the effects of two policies in support of elderly care. I find that agents substitute hours of work for hours of informal care in response to increases in their non-labor income. By contrast, if the price of formal care falls while holding everything else constant, agents prefer to replace hours of informal care with formal care.

Although a simple framework like this is useful to understand the mechanisms behind work and care decisions, it might be worth contemplating some extensions. Among them, it would be interesting to take advantage of the degrees of freedom that are left in the model and work on a respecification with more parameters to deal with preference-related aspects in detail, or include other time allocation alternatives, such as housework. These extensions might help study the differences observed across countries and between women and men, and improve the model fit.

Furthermore, my model overlooks any aspect regarding dynamics. Dynamics

may be important, because time away from the labor market to take care of parents can make it difficult to return to the labor force once the care episode has finished. On top of that, the opportunity costs of providing care may evolve over time, decreasing if the agent becomes more productive at these tasks because of learning, or increasing if the health of the parents deteriorates or the caregiver experiences burnout. A way to address this concerns could be to consider a dynamic structural model incorporating elements such as shocks to the parent's or the caregiver's health, human capital accumulation or depreciation, labor market frictions, and permanent unobserved heterogeneity. A framework with these ingredients would enable to examine the long-term effects of caring for parents on labor market outcomes, and perhaps extend the analysis to other issues such as savings and retirement.

Apart from that, in my model I dismiss any interaction among siblings or household members, which may have multiple implications. On the one hand, the individual care burden can be reduced in the presence of siblings if they share care responsibilities. On the other hand, each sibling may have incentives to free-ride on the effort exerted by the others and elude care duties. These problems could be approached in a game theoretic setting where each family member decides how to contribute to care for the elderly while anticipating the behavior of the others.

Acknowledgments

This paper uses data from SHARE release 6.1.1. as of January 28, 2019 (see Börsch-Supan, Brandt, Hunkler, Kneip, Korbmacher, Malter, Schaen, Stuck and Zuber (2013) for methodological details). The SHARE data collection has been primarily funded by the European Commission through FP5 (QLK6-CT-2001-00360), FP6 (SHARE-I3: RII-CT-2006-062193, COMPARE: CIT5-CT-2005-028857, SHARE-LIFE: CIT4-CT-2006-028812) and FP7 (SHARE-PREP: N°211909, SHARE-LEAP: N°227822, SHARE M4: N°261982). Additional funding from the German Ministry of Education and Research, the Max Planck Society for the Advancement of Science, the U.S. National Institute on Aging (U01-AG09740-13S2, P01-AG005842, P01-AG08291, P30-AG12815, R21-AG025169, Y1-AG-4553-01, IAG-BSR06-11, OGHA-04-064, HHSN271201300071C) and from various national funding sources is gratefully acknowledged (see www.share-project.org).

I acknowledge financial support from the Barcelona GSE-UAB IDEA PhD Track Fellowship, the Spanish Ministry of Economy and Competitiveness through grant ECO2015-63679-P, the Secretaria d'Universitats i Recerca de la Generalitat de Catalunya and the European Social Fund through the FI-AGAUR Predoctoral Fellowship, and the European Research Council through Starting Grant n° 804989.

References

- Attias-Donfut, Claudine, Jim Ogg, and François-Charles Wolff**, “Family Support,” in “Health, Ageing and Retirement in Europe. First Results from the Survey of Health, Ageing and Retirement in Europe,” Mannheim Research Institute for the Economics of Aging, 2005, pp. 171–178.
- Barczyk, Daniel and Matthias Kredler**, “Evaluating Long-Term-Care Policy Options, Taking the Family Seriously,” *The Review of Economic Studies*, 2018, 85 (2), 766–809.
- and —, “Long-Term Care Across Europe and the United States: The Role of Informal and Formal Care,” *Fiscal Studies*, 2019, 40 (3), 329–373.
- , **Sean Fahle, and Matthias Kredler**, “Save, Spend or Give? A Model of Housing, Family Insurance, and Savings in Old Age,” Working Paper 2022.
- Bolin, Kristian, Bjorn Lindgren, and Petter Lundborg**, “Your Next of Kin or Your Own Career? Caring and Working Among the 50+ of Europe,” *Journal of Health Economics*, 2008, 27 (3), 718–738.
- Brouwer, Werner B.F., N. Job A. van Exel, Bernard van den Berg, Geertruidis A.M. van den Bos, and Marc A. Koopmanschap**, “Process Utility from Providing Informal Care: The Benefit of Caring,” *Health Policy*, 2005, 74 (1), 85–99.
- Byrne, David, Michelle S. Goeree, Bridget Hiedemann, and Steven Stern**, “Formal Home Health Care, Informal Care, and Family Decision Making,” *International Economic Review*, 2009, 50 (4), 1205–1242.
- Börsch-Supan, Axel, Martina Brandt, Christian Hunkler, Thorsten Kneip, Julie Korbmacher, Frederic Malter, Barbara Schaan, Stephanie Stuck, and Sabrina Zuber**, “Data Resource Profile: The Survey of Health, Ageing and Retirement in Europe (SHARE),” *International Journal of Epidemiology*, 2013, 42 (4), 992–1001.
- Carmichael, Fiona and Susan Charles**, “The Labour Market Costs of Community Care,” *Journal of Health Economics*, 1998, 17, 747–765.
- and —, “The Opportunity Costs of Informal Care: Does Gender Matter?,” *Journal of Health Economics*, 2003, 22 (5), 781–803.

- Casado-Marín, David, Pilar García-Gómez, and Ángel López-Nicolás**, “Informal care and labour force participation among middle-aged women in Spain,” *SERIEs*, 2011, 2 (1), 1–29.
- Clancy, Rebecca L., Gwenith G. Fisher, Kelsie L. Daigle, Christine A. Henle, Jean McCarthy, and Christine A. Fruhauf**, “Eldercare and Work Among Informal Caregivers: A Multidisciplinary Review and Recommendations for Future Research,” *Journal of Business and Psychology*, 2019, 33, 1–19.
- Colombo, Francesca, Ana Llana-Nozal, Jérôme Mercier, and Frits Tjadens**, *Help Wanted? Providing and Paying for Long-Term Care*, OECD, 2011.
- Crespo, Laura**, “Caring for Parents and Employment Status of European Mid-Life Women,” Working Paper, CEMFI 2008.
- **and Pedro Mira**, “Caregiving to Elderly Parents and Employment Status of European Mature Women,” *Review of Economics and Statistics*, 2014, 96 (4), 693–709.
- De Nardi, Mariacristina, Eric French, and John B. Jones**, “Why Do the Elderly Save? The Role of Medical Expenses,” *Journal of Political Economy*, feb 2010, 118 (1), 39–75.
- Dobrescu, Loretta I.**, “To Love or to Pay: Savings and Health Care in Older Age,” *Journal of Human Resources*, 2015, 50 (1), 254–299.
- **and Fedor Iskhakov**, “Bequest Motives in a Life-Cycle Model with Intergenerational Interactions,” Working Paper 2013.
- Ettner, Susan L.**, “The Impact of “Parent Care” on Female Labor Supply Decisions,” *Demography*, 1995, 32 (1), 63.
- , “The Opportunity Costs of Elder Care,” *The Journal of Human Resources*, 1996, 31 (1), 189.
- European Commission**, “The 2018 Ageing Report: Economic & Budgetary Projections for the 28 EU Member States (2016-2070),” Institutional Paper 079, Directorate-General for Economic and Financial Affairs 2018.
- , *Joint Report on Health Care and Long-Term Care Systems & Fiscal Sustainability: Country Documents 2019 Update*, Luxembourg: Publications Office of the European Union, 2019.

- Heitmueller, Axel**, “The Chicken or the Egg? Endogeneity in Labour Market Participation of Informal Carers in England,” *Journal of Health Economics*, 2007, 26 (3), 536–559.
- Johnson, Richard W. and Anthony T. Lo Sasso**, “The Trade-Off between Hours of Paid Employment and Time Assistance to Elderly Parents at Midlife,” Technical Report, Urban Institute 2000.
- Ko, Ami**, “An Equilibrium Analysis of the Long-Term Care Insurance Market,” *The Review of Economic Studies*, 2021.
- Kohli, Martin, Harald Kunemund, and Jorg Ludicke**, “Family Structure, Proximity and Contact,” in “Health, Ageing and Retirement in Europe: First Results from the Survey of Health, Ageing and Retirement in Europe,” Mannheim Research Institute for the Economics of Aging, 2005.
- Korfhage, Thorben**, “Long-Run Consequences of Informal Elderly Care and Implications of Public Long-Term Care Insurance,” Working Paper 2019.
- Michaud, Pierre-Carl, Axel Heitmueller, and Zafar Nazarov**, “A Dynamic Analysis of Informal Care and Employment in England,” *Labour Economics*, 2010, 17 (3), 455–465.
- Mommaerts, Corinna**, “Long-Term Care Insurance and the Family,” Working Paper 2020.
- Pezzin, Liliana E. and Barbara Steinberg Schone**, “Intergenerational Household Formation, Female Labor Supply and Informal Caregiving: A Bargaining Approach,” *The Journal of Human Resources*, 1999, 34 (3), 475.
- Reher, David Sven**, “Family Ties in Western Europe: Persistent Contrasts,” *Population and Development Review*, June 1998, 24 (2), 203–234.
- Schmitz, Hendrik and Matthias Westphal**, “Informal Care and Long-Term Labor Market Outcomes,” *Journal of Health Economics*, 2017, 56, 1–18.
- Skira, Meghan M.**, “Dynamic Wage and Employment Effects of Elder Parent Care,” *International Economic Review*, 2015, 56 (1), 63–93.
- Spiess, C. Katharina and A. Ulrike Schneider**, “Interactions Between Caregiving and Paid Work Hours among European Midlife Women, 1994 to 1996,” *Ageing and Society*, 2003, 23 (1), 41–68.

- Staiger, Douglas and James H. Stock**, “Instrumental Variables Regression with Weak Instruments,” *Econometrica*, 1997, 65 (3), 557.
- Viitanen, Tarja K.**, “Informal Elderly Care and Women’s Labour Force Participation Across Europe,” Research Report 13, ENEPRI 2005.
- Wolf, Douglas A. and Beth J. Soldo**, “Married Women’s Allocation of Time to Employment and Care of Elderly Parents,” *The Journal of Human Resources*, 1994, 29 (4), 1259.

APPENDIX A: DATA CONSTRUCTION

A1. Hours of informal care given to parents

I obtain this information from the answers of the respondents to the question about the frequency with which they provided care in the last twelve months. They are able to choose among “almost every day”, “almost every week”, “almost every month” and “less often”. Next, they are asked about the number of hours of care which they gave on a typical day/week/month or in the last twelve months. In order to obtain the equivalent amount of hours of care provided weekly, I multiply the number of hours given on a typical day by 7 if the respondent chose this alternative. If she reported giving care almost every week, the number of hours is kept as it is. If care was given on a monthly basis, the number is divided by 4.28, and in the remaining case it is divided by 52. If for some reason the resulting amount of care is larger than 0, but parents were reported to be deceased, the number of hours of care is set to 0.

A2. Hours of formal care received by parents

In SHARE, respondents are asked whether they received professional or paid nursing or personal care, help for domestic tasks that they cannot perform themselves due to health problems, or meals-on-wheels at home during the last twelve months. Following that, they are asked for how many hours a week they received professional or paid nursing care, and for how many hours they received professional help with domestic tasks. Thus, the sum of these two numbers constitutes a measure of the number of hours of formal care received weekly at home. To account for the use of nursing homes, I look at the answers of the respondents when they are asked whether they have been in a nursing home overnight during the last twelve months. Respondents can say “yes, permanently” if they have stayed in a nursing home non-stop during the past twelve months; “yes, temporarily”, in the case they definitely moved to a nursing home less than twelve months ago; or “no”. If the respondent says “yes”, she is assigned 168 hours of formal care weekly. Next, those respondents who report having at least one parent alive are imputed a number of hours of formal care for their parents. This number is computed as the mean by health status, age and household income decile of respondents in my sample. The resulting amount for individuals of health h , age a , and income decile d is assigned to those individuals who report having parents of health h , age a , and income decile d . If the outcome of this process turns out to be larger than 0, but parents were reported to be deceased, this number is set to 0.

A3. Expenditure on formal care received by parents

The SHARE questionnaire asks respondents how much they paid out-of-pocket for all the care which they received in nursing homes and day-care centers, and all home care services in the last twelve months, not counting health insurance premia. Analogously to the number of hours of formal care, I compute the average expenditure on formal care for each combination of health h , age a , and income decile d among respondents, and impute that number to those individuals who report having parents of health h , age a , and income decile d . The outcome of this process intends to approximate the expenditure on formal care received by the parents of the respondents. If the outcome is larger than 0 for individuals whose parents are deceased, this number is set to 0.

A4. Hours of care required by parents

In the health module of SHARE, respondents are asked whether they have any difficulty to perform daily-life activities because of physical, mental, emotional or memory problems. I build a measure of the number of hours of care which respondents in my sample would need to receive every week by assigning a certain amount of time to each activity with which respondents mention to have problems. The daily-life activities considered are dressing, walking across a room, bathing, eating, getting in or out of bed, using the toilet, preparing a hot meal, shopping for groceries, making telephone calls, taking medications, doing work around the house, and managing money. Because of the lack of information about the parents of the respondents having difficulties to perform these activities, I impute a number of hours of care required to those individuals in the sample who have at least one parent alive. In particular, the average number of hours of care required by individuals of health h and age a is assigned to those respondents who report having parents of health h and age a . The outcome of this process is a variable which takes values from 0 to 56 hours of care weekly. If the outcome turns out to be larger than 0, but the parents of the respondents are deceased, this number is set to 0.

A5. Being employed and hours worked

Respondents are asked to describe their current employment situation, which can be categorized as “retired”, “employed or self-employed”, “unemployed and looking for work”, “permanently sick or disabled”, “homemaker”, and “other” (landlord, living off own property, student, doing voluntary work). For the purpose of my project, I create a dummy variable which equals 1 if the individual is employed

or self-employed, and 0 if she is unemployed or homemaker (non-employed). This dummy only takes values for individuals younger than 65, to exclude those who do not have a job to retire from but are in age of retirement. As for the number of hours worked, respondents report how many hours they usually work a week, excluding meal breaks but including any paid or unpaid overtime.

A6. Health status

The SHARE questionnaire includes a question that asks whether the respondent perceives her health as excellent, very good, good, fair or poor. I use this information about self-perceived health to create a bad health dummy which takes value 1 if the individual reports that her health is fair or poor, and 0 otherwise. A dummy for the health status of the parents of the respondent is created analogously from the information which respondents give about the health of their parents. If both the father and the mother of the respondent are alive, I take the worse health status of the two. In the case that none of them are alive, the dummy takes value 0.

A7. Distance to parental residence

SHARE asks respondents where their mother and father live, being able to choose among “in the same household”, “in the same building”, or one of seven categories in terms of number of kilometers away. I create a dummy that is equal to 1 if the respondent has at least one parent living less than 25 km away, including the possibility of living in the same household or in the same building. In case both parents are deceased, this variable takes value 0.

A8. Labor income

Respondents are asked whether they had any wages, salaries or other earnings from dependent employment, and whether they had any income at all from self-employment or work for a family business in the previous year. If they reply “yes”, they are asked how much income, after any taxes, contributions and production costs, they received from these activities. Using this information, and the number of months which the respondents spent working, I compute the income from employment and self-employment which they would have received every week. Next, I sum the amounts corresponding to these two concepts of labor income, adjust the results by purchasing power parity, and express all quantities in Euros using the exchange rates provided by SHARE.

A9. *Non-labor income*

This variable comprises all income sources of the household except for the labor earnings of the respondent. This number is obtained as the sum of annual net income from pensions, unemployment benefits and insurance, social assistance, disability and sickness benefits, rent or sublet, bank accounts, bonds, stocks, mutual funds, other regular payments from private pensions or transfers, and other household members. This amount is adjusted by purchasing power parity, expressed in Euros using the exchange rates provided by SHARE, and divided by 52 to have a measure of weekly non-labor income.

APPENDIX B: FIGURES

FIGURE B1: AGE OF RECIPIENTS OF DAILY CARE FROM THEIR CHILDREN. SHARE WAVE 2

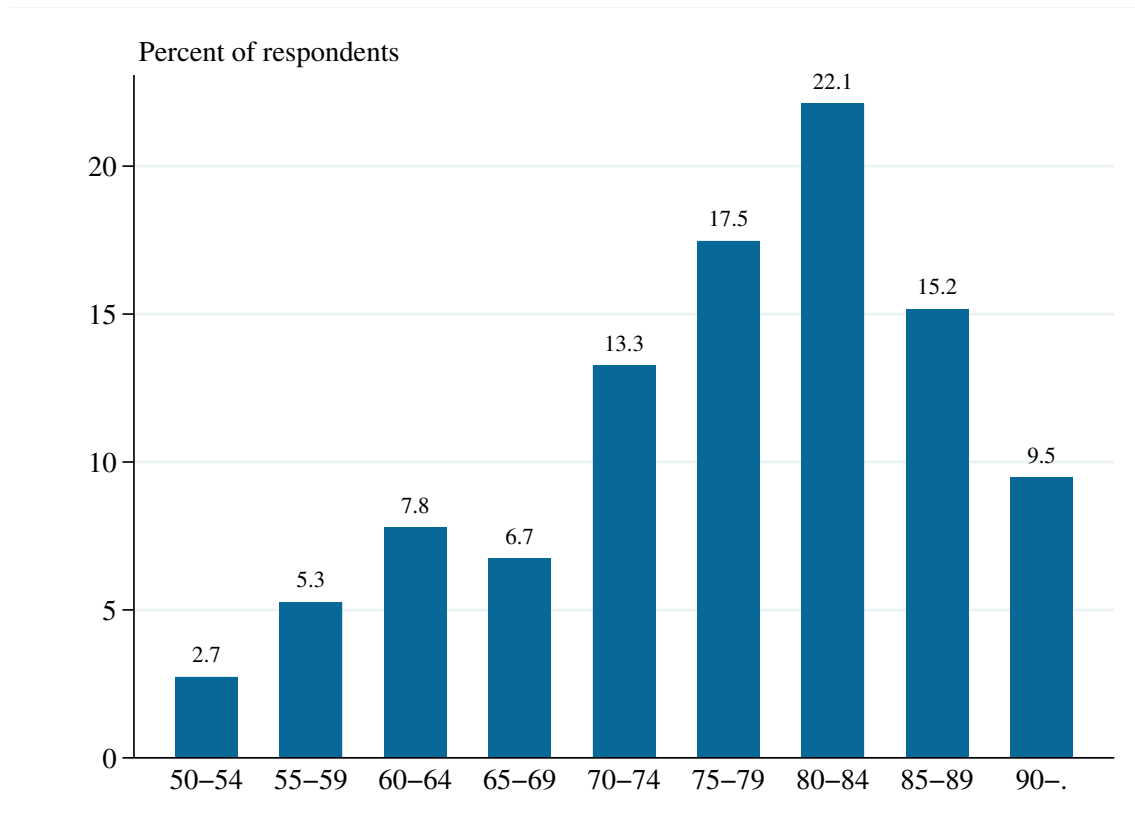


FIGURE B2: COMPARISON OF EMPLOYMENT STATUS ACROSS GENDER AND COUNTRY GROUPS. NON-CAREGIVERS VS. CAREGIVERS. INDIVIDUALS YOUNGER THAN 65 WITH AT LEAST ONE PARENT ALIVE. SHARE WAVE 2

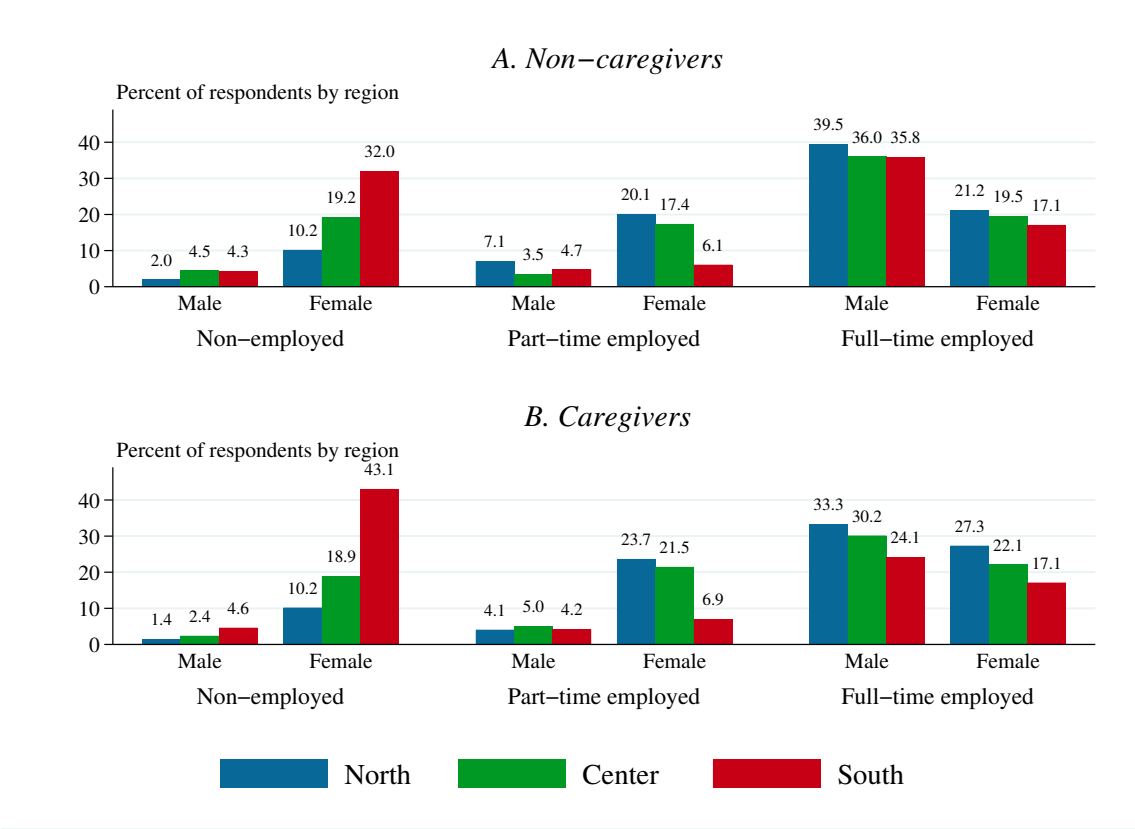
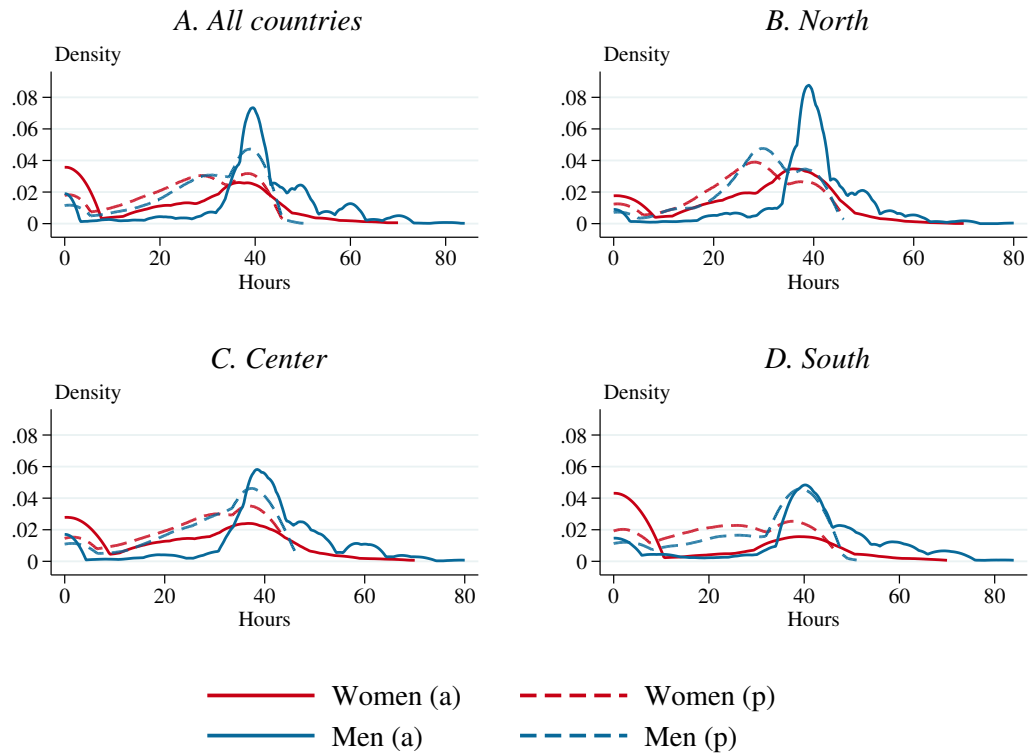


FIGURE B3: COMPARISON OF HOURS WORKED WEEKLY ACROSS GENDER. ACTUAL (A) VS. PREDICTED (P). KERNEL DENSITY ESTIMATES. INDIVIDUALS YOUNGER THAN 65 WITH AT LEAST ONE PARENT ALIVE. SHARE WAVE 2



APPENDIX C: TABLES

TABLE C1: DESCRIPTIVE STATISTICS. ALL THE INDIVIDUALS IN THE SAMPLE.
SHARE WAVE 2

	Mean	Std. Dev.
Dependent variables		
Being employed (dummy)	0.27	0.44
Hours worked (weekly)	10.33	18.30
Independent variables		
Hours of informal care (weekly)	0.65	5.55
Being a caregiver (dummy)	0.08	0.27
Age	65.33	9.99
Female (dummy)	0.54	0.50
Years of education	10.32	4.47
Log household income (weekly)	5.88	1.30
Married (dummy)	0.74	0.44
Bad health (dummy)	0.32	0.47
Hours of formal care received by parents (weekly)	0.49	3.70
Expenditure on formal care for parents (€, weekly)	0.79	5.22
Hours of care required by parents (weekly)	0.55	2.01
Instruments		
Bad parental health (dummy)	0.98	0.14
Distance to parental residence < 25 km (dummy)	0.14	0.35

TABLE C2: IV FIRST STAGE REGRESSIONS

	Hours of informal care			Being a caregiver (dummy)		
	All	Women	Men	All	Women	Men
Bad parental health (dummy)	1.367*** (0.477)	1.677** (0.796)	1.068** (0.502)	0.147*** (0.024)	0.152*** (0.037)	0.142*** (0.031)
Distance to parental residence < 25 km (dummy)	2.401*** (0.443)	2.818*** (0.667)	1.961*** (0.566)	0.260*** (0.015)	0.300*** (0.020)	0.217*** (0.023)
Age	1.052 (1.034)	0.878 (1.621)	1.008 (1.006)	0.042 (0.038)	0.036 (0.050)	0.031 (0.059)
Age squared	-0.009 (0.009)	-0.008 (0.014)	-0.009 (0.009)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.001)
Female (dummy)	1.264*** (0.309)			0.049*** (0.011)		
Years of education	0.077 (0.051)	0.153 (0.097)	0.003 (0.027)	0.007*** (0.001)	0.005*** (0.002)	0.009*** (0.002)
Log household income (weekly)	-0.074 (0.099)	-0.242 (0.207)	0.062 (0.050)	0.008*** (0.003)	0.007* (0.004)	0.009** (0.004)
Married (dummy)	-0.161 (0.420)	-0.138 (0.666)	-0.171 (0.291)	-0.013 (0.014)	-0.003 (0.019)	-0.028 (0.021)
Bad health (dummy)	0.694 (0.569)	1.223 (0.909)	-0.255 (0.356)	-0.015 (0.013)	-0.010 (0.016)	-0.021 (0.022)
Constant	-31.752 (29.642)	-26.073 (46.543)	-29.739 (28.915)	-1.310 (1.086)	-1.053 (1.439)	-1.019 (1.666)
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	8,715	5,055	3,660	8,715	5,055	3,660
F-stat excluded instruments	15.114	9.608	6.100	145.259	108.831	45.310

Note: Robust standard errors in parenthesis. (*) Significance at 10% level. (**) Significance at 5% level. (***) Significance at 1% level.

TABLE C3: OLS REGRESSIONS OF BEING EMPLOYED AND HOURS WORKED ON HOURS OF INFORMAL CARE. INDIVIDUALS YOUNGER THAN 65. SHARE WAVE 2

	Being employed (dummy)			Hours worked		
	All	Women	Men	All	Women	Men
Hours of informal care (weekly)	-0.002** (0.001)	-0.002*** (0.001)	-0.002 (0.003)	-0.068** (0.031)	-0.057** (0.025)	-0.127 (0.124)
Age	0.239*** (0.055)	0.234*** (0.066)	0.196** (0.087)	8.899*** (2.429)	6.869*** (2.547)	9.943** (4.347)
Age squared	-0.002*** (0.000)	-0.002*** (0.001)	-0.002** (0.001)	-0.085*** (0.021)	-0.069*** (0.022)	-0.090** (0.038)
Female (dummy)	-0.288*** (0.015)			-17.759*** (0.667)		
Years of education	0.020*** (0.002)	0.030*** (0.003)	0.007*** (0.002)	0.763*** (0.080)	1.125*** (0.103)	0.280** (0.120)
Log household income (weekly)	0.026*** (0.004)	0.034*** (0.006)	0.023*** (0.005)	1.064*** (0.188)	1.139*** (0.222)	1.050*** (0.298)
Married (dummy)	-0.077*** (0.019)	-0.155*** (0.023)	0.062** (0.029)	-2.409*** (0.846)	-6.833*** (0.979)	4.833*** (1.375)
Bad health (dummy)	-0.113*** (0.019)	-0.104*** (0.023)	-0.086*** (0.029)	-4.449*** (0.789)	-3.589*** (0.871)	-4.770*** (1.415)
Constant	-5.624*** (1.574)	-5.715*** (1.865)	-4.675* (2.483)	-205.194*** (69.154)	-161.197** (72.611)	-246.232** (123.103)
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	8,715	5,055	3,660	8,715	5,055	3,660
R ²	0.274	0.281	0.079	0.317	0.257	0.067

Note: Robust standard errors in parenthesis. (*) Significance at 10% level. (**) Significance at 5% level. (***) Significance at 1% level.

TABLE C4: IV REGRESSIONS OF BEING EMPLOYED AND HOURS WORKED ON HOURS OF INFORMAL CARE. INDIVIDUALS YOUNGER THAN 65. SHARE WAVE 2

	Being employed (dummy)			Hours worked		
	All	Women	Men	All	Women	Men
Hours of informal care (weekly)	0.009 (0.007)	0.003 (0.008)	0.011 (0.012)	0.304 (0.301)	0.129 (0.296)	0.270 (0.591)
Age	0.226*** (0.055)	0.229*** (0.066)	0.180** (0.086)	8.423*** (2.403)	6.650*** (2.519)	9.468** (4.284)
Age squared	-0.002*** (0.000)	-0.002*** (0.001)	-0.002** (0.001)	-0.080*** (0.021)	-0.067*** (0.022)	-0.085** (0.038)
Female (dummy)	-0.302*** (0.017)			-18.224*** (0.760)		
Years of education	0.019*** (0.002)	0.029*** (0.003)	0.007*** (0.002)	0.737*** (0.086)	1.098*** (0.114)	0.283** (0.120)
Log household income (weekly)	0.027*** (0.004)	0.035*** (0.007)	0.022*** (0.006)	1.090*** (0.195)	1.183*** (0.241)	1.026*** (0.298)
Married (dummy)	-0.077*** (0.020)	-0.155*** (0.024)	0.061** (0.029)	-2.412*** (0.851)	-6.834*** (0.978)	4.822*** (1.380)
Bad health (dummy)	-0.119*** (0.020)	-0.108*** (0.025)	-0.082*** (0.029)	-4.667*** (0.830)	-3.800*** (0.944)	-4.627*** (1.414)
Constant	-5.257*** (1.565)	-5.585*** (1.855)	-4.256* (2.432)	-192.385*** (68.340)	-155.594** (71.694)	-233.506* (121.289)
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	8,715	5,055	3,660	8,715	5,055	3,660
R ²	0.235	0.273	0.038	0.294	0.246	0.054

Note: Robust standard errors in parenthesis. (*) Significance at 10% level. (**) Significance at 5% level. (***) Significance at 1% level.

TABLE C5: OLS REGRESSIONS OF BEING EMPLOYED AND HOURS WORKED ON BEING A CAREGIVER. INDIVIDUALS YOUNGER THAN 65. SHARE WAVE 2

	Being employed (dummy)			Hours worked		
	All	Women	Men	All	Women	Men
Being a caregiver (dummy)	0.008 (0.020)	0.020 (0.025)	-0.004 (0.028)	0.369 (0.928)	1.219 (1.029)	-0.651 (1.544)
Age	0.236*** (0.055)	0.231*** (0.065)	0.194** (0.087)	8.787*** (2.418)	6.722*** (2.520)	9.826** (4.339)
Age squared	-0.002*** (0.000)	-0.002*** (0.001)	-0.002** (0.001)	-0.084*** (0.021)	-0.068*** (0.022)	-0.089** (0.038)
Female (dummy)	-0.291*** (0.015)			-17.862*** (0.666)		
Years of education	0.020*** (0.002)	0.030*** (0.003)	0.007*** (0.002)	0.756*** (0.080)	1.112*** (0.102)	0.286** (0.121)
Log household income (weekly)	0.026*** (0.004)	0.035*** (0.006)	0.022*** (0.005)	1.066*** (0.188)	1.143*** (0.223)	1.048*** (0.298)
Married (dummy)	-0.077*** (0.019)	-0.155*** (0.023)	0.062** (0.029)	-2.412*** (0.845)	-6.848*** (0.975)	4.826*** (1.375)
Bad health (dummy)	-0.114*** (0.019)	-0.105*** (0.023)	-0.086*** (0.029)	-4.479*** (0.789)	-3.628*** (0.873)	-4.745*** (1.415)
Constant	-5.544*** (1.566)	-5.633*** (1.853)	-4.615* (2.479)	-202.256*** (68.840)	-157.712** (71.801)	-243.019** (122.884)
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	8,715	5,055	3,660	8,715	5,055	3,660
R^2	0.273	0.280	0.078	0.316	0.256	0.065

Note: Robust standard errors in parenthesis. (*) Significance at 10% level. (**) Significance at 5% level. (***) Significance at 1% level.

TABLE C6: IV REGRESSIONS OF BEING EMPLOYED AND HOURS WORKED ON BEING A CAREGIVER. INDIVIDUALS YOUNGER THAN 65. SHARE WAVE 2

	Being employed (dummy)			Hours worked		
	All	Women	Men	All	Women	Men
Being a caregiver (dummy)	0.081 (0.060)	0.025 (0.071)	0.088 (0.100)	2.812 (2.709)	1.190 (2.763)	2.120 (5.185)
Age	0.232*** (0.055)	0.231*** (0.065)	0.189** (0.086)	8.625*** (2.397)	6.724*** (2.511)	9.677** (4.310)
Age squared	-0.002*** (0.000)	-0.002*** (0.001)	-0.002** (0.001)	-0.082*** (0.021)	-0.068*** (0.022)	-0.087** (0.038)
Female (dummy)	-0.295*** (0.015)			-17.979*** (0.673)		
Years of education	0.019*** (0.002)	0.030*** (0.003)	0.006** (0.003)	0.742*** (0.083)	1.112*** (0.103)	0.265** (0.130)
Log household income (weekly)	0.026*** (0.004)	0.035*** (0.006)	0.022*** (0.006)	1.046*** (0.188)	1.143*** (0.222)	1.023*** (0.299)
Married (dummy)	-0.078*** (0.019)	-0.155*** (0.023)	0.062** (0.029)	-2.425*** (0.842)	-6.848*** (0.972)	4.842*** (1.377)
Bad health (dummy)	-0.112*** (0.019)	-0.105*** (0.023)	-0.083*** (0.029)	-4.414*** (0.785)	-3.628*** (0.870)	-4.657*** (1.409)
Constant	-5.428*** (1.551)	-5.627*** (1.849)	-4.494* (2.447)	-198.354*** (68.248)	-157.753** (71.557)	-239.366** (122.114)
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	8,715	5,055	3,660	8,715	5,055	3,660
R^2	0.270	0.280	0.070	0.315	0.256	0.063

Note: Robust standard errors in parenthesis. (*) Significance at 10% level. (**) Significance at 5% level. (***) Significance at 1% level.