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Short- and Medium-Term Effects of Informal Eldercare on Labor Market Outcomes

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Short- and Medium-Term Effects of Informal Eldercare on Labor Market Outcomes

Dörte Heger and Thorben Korfhage

ABSTRACT

Informal caregivers, often family members, provide valuable services to elderly persons with long-term care needs. However, the time commitment of caregiving often competes against time spent in the labor force. In addition to the momentary trade-off, long-term consequences are possible since older workers in particular might find it difficult to reenter the labor market after a period of caregiving. While several studies document a negative relationship between caregiving and paid work, little is known about whether this effect persists over time. Analyzing a large panel data set of fifteen European countries and Israel, this study shows that care provision for an elderly parent has negative effects on employment rates and paid working hours for both men and women. While men are more likely to drop out of the labor force, especially in response to continuous caregiving, women, on average, also reduce their paid working hours.

KEYWORDS

Long-term care, informal care, labor market outcomes, short- and medium-term effects

JEL Codes: J14, J22

HIGHLIGHTS

- Adults who provide informal unpaid care for aging parents may struggle to maintain full-time paid employment.
- In aging societies the problem will become acute, as mature workers who leave paid jobs for caregiving risk future financial challenges.
- Short-term caregiving reduces both men's and women's probabilities of paid employment; longer-term caregiving has labor market outcomes that reflect traditional gender roles.
- Policymakers could reduce financial risks for informal caregivers by encouraging work flexibility, instituting paid leaves, and facilitating return to full-time paid work after stints of part-time employment.

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INTRODUCTION

When a parent's health declines, adult children are often faced with the decision whether to assist their parent with personal care or household chores. While such informal caregiving can be rewarding as it may convey a feeling of purpose or strengthen family bonds, frequent caregiving, besides being emotionally and physically demanding, presents a considerable time requirement. Acting as an informal caregiver thus often competes with participating in the labor force. As a consequence, caregivers may incur considerable costs since reducing paid working hours or dropping out of the labor force may lead to income losses, reduced pension benefits, and a lower chance of future employment or promotions. Such opportunity costs of caregiving could be even larger if the negative relationship persists over time, that is, if the caregiving lasts for a prolonged period or if negative effects remain even after care has ended. For example, if caregivers are unable to take up employment again after the care period has ended due to labor market frictions, caregiving not only reduces present labor income but also expected future earnings (Skira 2015). In light of our aging societies, labor market outcomes for mature caregivers are of special interest since individuals close to the retirement age might be less attached to the labor force than younger individuals (Humpert and Pfeifer 2013). Moreover, reentering the labor market might be especially difficult for older workers due to, for example, fixed hiring costs or technological skill obsolescence (Straka 1992). Understanding whether caregiving and paid work are compatible thus also provides insight into caregivers' risk of financial vulnerability later in life.

This paper analyzes how caregiving to parents affects mature caregivers' labor market participation in the short and medium terms. Theoretically, the direction of the effect of caregiving on labor market outcomes is uncertain and depends on whether the "substitution effect" or "income effect" dominates (Carmichael and Charles 1998). That is, caregiving may reduce employment or paid hours worked if caregivers substitute work time with care time or if caregivers' increased absenteeism to fulfill caregiving obligations leads to job loss (Heitmueller and Inglis 2007). Yet, labor market participation may increase if employment offers respite from caregiving or if caregivers require additional income (Carmichael and Charles 1998, 2003). Empirically determining causal effects, however, is challenging due to reverse causality.

Persons with less attachment to the labor market or a low time cost are more likely to become caregivers (Ettner 1995, 1996; Heitmueller 2007; Carmichael, Charles, and Hulme 2010). In addition, labor force participation and caregiving may be influenced by the same unobserved characteristics, which would produce a spurious correlation. For example, individuals with high (unobserved) ability may be more productive

employees and may also be more productive at providing informal care (He and McHenry 2016).

Numerous studies report a negative relationship between care activities and labor market participation (Schneider, Drobnic, and Blossfeld 2001; Carmichael and Charles 2003; Lilly, Laporte, and Coyte 2007; Berecki-Gisolf et al. 2008; Bolin, Lindgren, and Lundborg 2008; Leigh 2010; Lilly, Laporte, and Coyte 2010; Viitanen 2010; Calvano 2013; King and Pickard 2013; Van Houtven, Coe, and Skira 2013; Crespo and Mira 2014; Heger 2014; Nguyen and Connelly 2014; ; Bauer and Sousa-Poza 2015). While average effects are usually small – Kristian Bolin, Bjorn Lindgren, and Petter Lundborg (2008) estimates that, for Europe, a 10 percent increase in time spent on caregiving is associated with a 3.7 percentage points decrease in caregivers' employment probability – larger effects are found for intensive caregivers who typically provide daily or almost daily care (Lilly, Laporte, and Coyte 2007), for co-residential caregiving (Heitmueller 2007), and when satisfaction with caregiving tasks are low or the care recipient suffers from cognitive or mental disabilities (Calvano 2013).[1] Additionally, Siobhan Austen and Rachel Ong (2013) show that women in low-skilled jobs face greater diffculties in combining work and caregiving duties in their study of mid-life Australian women. Other studies, however, do not find a significant effect or only find negative effects for intensive caregivers (Wolf and Soldo 1994; Stern 1995; Kotsadam 2011; Meng 2013). Mediating factors that reduce negative labor force outcomes include a flexible work environment, satisfaction with care tasks, and when paid work offers a "buffer" from caregiving activities (Calvano 2013; Schneider et al. 2013). Looking at paid working hours, results are more consistent: Caregivers are, on average, more likely to work fewer hours for pay than non-caregivers, but the magnitude of the effect is generally small and depends on caregivers' characteristics (Ettner 1995, 1996; Spiess and Schneider 2003; Johnson and Lo Sasso 2006; Lilly, Laporte, and Coyte 2007; Berecki-Gisolf et al. 2008; Bolin, Lindgren, and Lundborg 2008; Carmichael et al. 2008; Lilly, Laporte, and Coyte 2010; Van Houtven, Coe, and Skira 2013; Bauer and Sousa-Poza 2015). While Susan L. Ettner (1996) finds larger effects of caregiving on paid working hours for women as well as for co-residential caregivers, Bolin, Lindgren, and Lundborg (2008) find an average elasticity of -0.26 for paid working hours with respect to hours spent on caring activities for a pooled sample of men and women, but their results are insignificant once they divide their sample by gender.

Yet, very little is known about the persistence of these effects. To the best of our knowledge, only four previous studies analyze possible medium-term or long-term consequences of caregiving on labor market outcomes, and only one of those looks at both caregiving men and women. The results are mixed and depend on the caregiving circumstances and on the country under study. Pierre-Carl Michaud, Axel Heitmueller, and

Zafar Nazarov (2010) find a negative effect of present co-residential caregiving on future employment for working age women in England. Meghan Skira (2015) studies women at midlife using US data covering the period 1994 to 2008. Her results highlight the importance of labor market frictions and show that, on average, women who dropped out of the labor market or reduced paid working hours to become a caregiver face difficulties returning to the labor market or increasing hours once the care period is over. Using German data, Hendrik Schmitz and Matthias Westphal (2017) analyze labor market outcomes of working age women up to eight years after care provision and find persistent negative effects on full-time work as well as long-run wage penalties that only fade slowly. Contrary to these results, Elisabeth Fevang, Snorre Kverndokk, and Knut Røed (2012), who use Norwegian register data on individuals ages 38–66 to estimate labor market outcomes up to ten years before and five years after the death of a lone parent, cannot confirm persistence: While the authors find a notable decrease of daughters' employment prior to a parent's death (for sons the effect is negligible), on average, the daughters' return to their previous level of employment after their parent's death.

We contribute to both strands of the caregiving literature by analyzing short- and medium-term effects of informal care given to a parent on different labor market outcomes, and, in particular, we concentrate on the effect of continuous caregiving, look at both caregiving men and women, focus on individuals close to retirement, and use a large sample of fifteen European countries and Israel. Specifically, we analyze how recent and/or past care provision to a parent affects caregivers' employment, retirement, hours worked, and full-time work using data drawn from five waves of the Survey of Health, Aging, and Retirement (SHARE) collected between 2004 and 2015. We address endogeneity of caregiving using an instrumental variables approach. Using alternative outcomes of labor supply allows us to draw a more nuanced picture of how individuals react to care provided to a parent and how this reaction differs by gender. While leaving employment may be a temporary reaction to caregiving, the decision to retire is usually permanent. Studying both outcomes allows us to differentiate between these reactions. Similarly, while studying paid hours worked provides information on how individuals adjust their working hours on average, focusing also on full-time work helps to understand whether this effect is driven by individuals switching from full-time to part-time employment.

We find that, in the short run, caregiving reduces women's employment probability by 5.4 percentage points and increases their probability to retire by 5.5 percentage points, while for men the probability of being employed is reduced by 7.6 percentage points, but the probability to retire is not affected. After a care period has ended, women and men are still 3.8 and 6.4 percentage points less likely to be employed, respectively, but only women face a persistent reduction of paid working hours by 6.6

percent, on average. Our results further show that women and men react differently when they are confronted with lasting care spells. While women, on average, reduce their working hours by almost 14 percent and are 4.8 percentage points less likely to work full-time if they are continuous caregivers, men do not change their paid working hours but are 14.0 percentage points more likely to leave employment and 7.5 percentage points more likely to retire.

DATA

We use data from waves 1, 2, and 4–6 of the Survey for Health, Aging and Retirement in Europe (SHARE) collected in 2004/2005, 2006/2007, 2010/2011, 2013, and 2015, which covers the population 50+ in Europe and Israel (see Axel Börsch-Supan et al. [2013] for methodological details).[2] SHARE is modeled after the English Longitudinal Study of Ageing (ELSA) and the US Health and Retirement Survey (HRS) and is the first data set to include a wide variety of health and sociodemographic information of the elderly at a pan-European level.[3] All countries that participated in at least two consecutive waves are included: Austria, Germany, Sweden, Spain, Italy, France, Denmark, Switzerland, Belgium (all waves), the Netherlands (waves 1 to 5), Greece (waves 1 and 2), the Czech Republic, Slovenia, Estonia (waves 4 to 6), Israel (waves 1, 2, 5 and 6), and Luxembourg (waves 5 and 6).

Likewise, only individuals who participated in at least two consecutive waves, that is, waves 1 and 2, 4 and 5, or 5 and 6, are included in the sample. This restriction is necessary as we require both current and lagged information on caregiving activities for our analysis. Due to attrition and the age of the interviewed individuals, we observe 70 percent of the respondents in exactly two consecutive waves, 27 percent in three consecutive waves, and only 3 percent in all waves. Hence, we consider all pairs of consecutive waves separately and pool the data such that the second of the two consecutive waves represents the "current period" $t = 0$, and the first of the two consecutive waves represents the "past period" $t = -1$ (see Figure 1 for a graphical representation). Individuals who participated, for example, in wave 4, 5, and 6 are thus included twice, once where wave 5 represents the "current period" and once where wave 5 represents the "past period". Our empirical strategy addresses this issue by clustering standard errors at the individual level.[4]

In each wave, respondents are asked whether in the last twelve months they have personally given care or practical household help, how often they provided such informal care, and to whom (see Table A4 in the Supplemental Online Appendix for the exact wording of the questions).[5] The respondents' answers to these questions in the "current period" hence provide information about recent caregiving activities. A recent caregiver

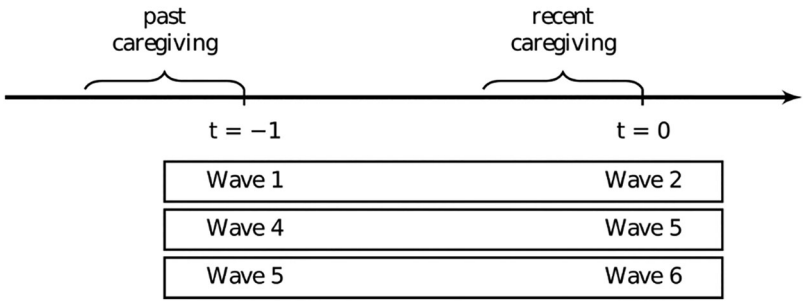

Figure 1 Time structure of the data

is thus a person who provided care to a parent in the current period, where we define care as daily or almost daily care provision. Both care outside and inside the household is considered. To distinguish between help during a short-term sickness, providing help to a co-residing parent is only considered caregiving if this help occurs during at least three months.[6] Since respondents might not only provide care to a parent but also to a partner or friend, which might lead to similar effects on labor market participation, we exclude individuals who are solely daily or almost daily caregiving for someone other than a parent to be able to clearly distinguish between caregivers and non-caregivers.[7] Individuals providing parental care less than daily or almost daily are also excluded from the analysis. For information about past caregiving we use the same information collected in the "past period," meaning if a past caregiver is a person who provided care to a parent daily or almost daily in the past period. Again, persons solely providing daily care to someone other than a parent, or providing care less than almost daily are dropped from the analysis. Since SHARE is conducted every other year, past caregiving generally represents caregiving activities between two and three years in the past. However, due to slightly varying interview years in some countries, for some individuals past caregiving can relate to care activities up to four years ago. We define continuous caregiving as caregiving in both periods, that is, a respondent is classified as continuous caregiver if he or she provided care to a parent in both the recent and the past period. To distinguish between the effects of only recent and only past caregiving, we further define only recent caregiving as caregiving in the recent period but not in the past period and only past caregiving as caregiving in the past period but not in the current period. All caregiving variables are thus defined as binary variables.

We only use information from the current period to define the remaining variables. We include four distinct labor market outcomes in our analysis. First, we consider employment, defined as a dummy variable that equals 1 if the respondent declares to be employed, including self-employed, or has

nevertheless worked for pay either as an employee or self-employed since the last interview. The binary choice whether to work or not is generally referred to as the extensive margin of labor supply. As an alternative measure for active labor market participation, we look at retirement, that is, whether an individual states that he or she is retired. The two measures differ slightly, as some individuals may be unemployed but not yet retired, while others have retired from their main job but nevertheless continue to work for pay.[8] Next, we consider two measures regarding the number of hours an individual works conditional on that an individual works positive hours, which is referred to as the intensive margin of labor supply. These measures are the number of hours an individual works per week and a dummy variable indicating full-time work, which we define according to the definition of the Organisation for Economic Co-operation and Development (OECD) as working for at least 30 h per week.[9]

Further, each wave provides information on the respondents' socioeconomic and demographic situation as well as on their parents. Additional independent variables used in our analysis include the respondents' age (both linear and squared) to account for different job offer probabilities and pension eligibility. For the same reason, we include two indicators for whether an individual will reach the country-specific effective retirement age within two years and whether he or she has already reached the country-specific effective retirement age.[10] Besides, we include an indicator for being married or living in a registered partnership since individuals might share their joint household income and divide labor between paid work and housework. Since individuals with children may have interrupted employment histories, we include the number of living children. In addition, we include several measures to capture respondents' health and socioeconomic situation since these factors may influence an individual's ability and motivation to be in paid employment and to provide informal care. Health is measured by the number of health conditions and two dummy variables indicating the presence of any limitations with activities of daily living (ADLs) and the presence of any limitations with instrumental ADLs, respectively. The socioeconomic situation of the respondents is proxied by educational status and wealth. Wealth is measured as household net worth including, among others, the value of primary residency, mortgages, other real estates, and bank accounts (Börsch-Supan et al. 2005), and is adjusted for household size by division by the square root of the number of household members. To make wealth more comparable between countries, we use a binary variable indicating whether a respondent's household wealth is above the sex- and country-specific sample median. Educational attainment is captured by dummy variables for lower (0-2), medium (3), and higher (4-6) education based on the ISCED- 97 classification (OECD 1999). To restrict our sample to individuals who could potentially provide care to a parent, only individuals

with a living parent in the past period are included in the sample. Since some parents may have passed away between the past and the current period, the share of individuals with a living parent in the present period may be below 1, and we include an indicator for whether at least one parent is alive in the current period. Finally, dummies for countries and waves are used to control for country-year specific effects, including, for example, the economic situation.

We further limit our sample to individuals ages 50–70 since we are interested in labor market outcomes, and labor force participation beyond the age of 70 is scarce. Since we concentrate on mature caregivers, we want to include as many elderly employed as possible to yield a comprehensive picture. Besides, to estimate medium-term effects, we need to observe individuals in at least two periods. Choosing a larger age range enables us to estimate these effects also for older individuals. This is especially important for estimating the effects on retirement. After deleting observations with missing information in our main variables, our sample includes 9,543 women and 6,752 men. Descriptive statistics are shown in Table 1 separately for recent caregivers and non-caregivers as well as for women and men.

While, in general, the variables only differ slightly with respect to caregiver status in our sample, only 57 percent of caregiving men are married relative to 72 percent for non-caregivers. This difference may result from the traditional caregiver role of women who often also provide care to their parents in-law (Colombo et al. 2011). Among recent caregivers, 48 percent of women and 50 percent of men are employed, though women work part time more often than men (32 percent vs. 8 percent). The explanatory variables of interest are the binary variables indicating caregiving activities. About 11 percent of women and 6 percent of men in our sample are recent caregivers. In the subsample of recent caregivers, 50 percent of women and 37 percent of men are continuous caregivers, meaning they also provided care in the past, while in the subsample of recent non-caregivers, only 8 percent of women and 4 percent of men were caregivers in the past period (only past caregivers). Hence, the timing and duration of caregiving activities might be important in explaining current labor market participation.

EMPIRICAL STRATEGY

To distinguish between short- and medium-term effects, we estimate the effects of only recent, only past, and continuous parental caregiving (CG_{or}, CG_{op}, and CG_{cont}, respectively) on four distinct labor market outcomes: employment (E), retirement (R), the number of hours an individual works for pay per week (H), and a dummy variable indication full-time work (FT).

We use a two-step model: While we estimate the effects of caregiving on the probability of being employed or retired for all respondents in

Table 1 Descriptive statistics

	Women						*Men*					
	Carers			*Non-carers*			*Carers*			*Non-carers*		
	Mean	*S.D.*	*Obs.*	*Mean*	*S.D.*	*Obs.*	*Mean*	*S.D.*	*Obs.*	*Mean*	*S.D.*	*Obs.*
Outcome												
Employed	0.48	0.50	1,092	0.61	0.49	8,451	0.50	0.50	418	0.70	0.46	6,334
Working hours[a]	32.50	13.33	447	33.52	12.23	4,747	41.75	12.40	178	40.87	12.52	4,074
Full-time work[a]	0.68	0.47	447	0.71	0.46	4,747	0.92	0.27	178	0.89	0.31	4,074
Retired	0.34	0.47	1,092	0.24	0.43	8,451	0.41	0.49	418	0.28	0.45	6,334
Explanatory variables												
Recent caregiver	1.00	0.00	1,092	0.00	0.00	8,451	1.00	0.00	418	0.00	0.00	6,334
Past caregiver	0.50	0.50	1,092	0.08	0.27	8,451	0.37	0.48	418	0.04	0.20	6,334
Parent alive	0.87	0.34	1,092	0.86	0.34	8,451	0.88	0.32	418	0.86	0.35	6,334
Age	60.00	4.68	1,092	58.75	4.70	8,451	60.22	4.58	418	59.11	4.53	6,334
Past effective retirement age	0.39	0.49	1,092	0.29	0.45	8,451	0.36	0.48	418	0.25	0.43	6,334
Close to effective retirement age	0.53	0.50	1,092	0.42	0.49	8,451	0.49	0.50	418	0.37	0.48	6,334
Married	0.66	0.47	1,092	0.65	0.48	8,451	0.57	0.50	418	0.72	0.45	6,334
Number of children	1.95	1.13	1,092	2.10	1.26	8,451	1.57	1.31	418	2.04	1.27	6,334
Wave 2	0.23	0.42	1,092	0.27	0.44	8,451	0.22	0.42	418	0.30	0.46	6,334
Wave 5	0.35	0.48	1,092	0.30	0.46	8,451	0.37	0.48	418	0.28	0.45	6,334
Wave 6	0.42	0.49	1,092	0.43	0.49	8,451	0.41	0.49	418	0.42	0.49	6,334
Number of chronic diseases	1.36	1.33	1,092	1.21	1.30	8,451	1.26	1.25	418	1.15	1.26	6,334
Number of ADL	0.08	0.52	1,092	0.09	0.47	8,451	0.08	0.39	418	0.10	0.49	6,334

(*Continued*).

Table 1 Continued.

	Women						*Men*					
	Carers			*Non-carers*			*Carers*			*Non-carers*		
	Mean	*S.D.*	*Obs.*	*Mean*	*S.D.*	*Obs.*	*Mean*	*S.D.*	*Obs.*	*Mean*	*S.D.*	*Obs.*
Number of IADL	0.13	0.66	1,092	0.16	0.62	8,451	0.13	0.61	418	0.11	0.58	6,334
Low education	0.34	0.47	1,092	0.28	0.45	8,451	0.28	0.45	418	0.25	0.44	6,334
Medium education	0.38	0.48	1,092	0.36	0.48	8,451	0.42	0.49	418	0.39	0.49	6,334
High education	0.29	0.45	1,092	0.36	0.48	8,451	0.30	0.46	418	0.35	0.48	6,334
Household wealth (in 10,000 Euro)	29.48	50.28	1,092	32.83	50.30	8,451	32.68	53.98	418	35.57	55.45	6,334
Instruments												
Number of sisters	0.97	1.16	888	1.23	1.25	7,392	0.96	1.14	325	1.22	1.19	5,438
Parent in poor or fair health[b]	0.65	0.48	1,075	0.51	0.50	8,277	0.68	0.47	414	0.50	0.50	6,191

Notes: [a] Working hours and full-time work are conditional on employment; [b] Zeros also include some cases were no parent is alive; S.D. = Standard deviation; Obs. = Observations.
Source: SHARE, own calculation.

our sample, we estimate the effects on hours worked and full-time work conditional on working positive hours. For the binary outcomes, we follow the literature and estimate linear probability models (Angrist and Evans 1998; Angrist 2001; Van Houtven, Coe, and Skira 2013; Kolodziej, Reichert, and Schmitz 2018). Results remain largely unchanged if probit models are used; results are provided in Table A8 in the Online Appendix. The linear probability model is our preferred specification since it can easily be extended to instrumental variable estimation, while non-linear equations can yield inconsistent results (Newey 1990; Cutler 2007; Wooldridge 2010). To obtain a smoother distribution for the continuous variable H, the logarithm of the number of hours is used as a dependent variable in the linear model. The resulting estimation equations are given as follows:[11]

$$L = \alpha^L + \beta^L CG_{or} + \gamma^L CG_{op} + \delta^L CG_{cont} + \lambda^L X + u^L, \quad \text{where } L = \{E, R\} \tag{1}$$

$$FT = \alpha^{FT} + \beta^{FT} CG_{or} + \gamma^{FT} CG_{op} + \delta^{FT} CG_{cont} + \lambda^{FT} X + u^{FT}, \forall H > 0 \tag{2}$$

$$log(H) = \alpha^H + \beta^H CG_{or} + \gamma^H CG_{op} + \delta^H CG_{cont} + \lambda^H X + u^H, \forall H > 0, \tag{3}$$

where X denotes the explanatory variables described earlier, and u is the equation specific error term. Including the set of the three binary caregiving variables allows us to capture the effect of only recent caregiving (β), only past caregiving (γ), and continuous caregiving (δ). To allow for heterogeneous effects between men and women, separate regressions are estimated for each gender. Since some individuals are included multiple times, standard errors might be heteroskedastic. We account for this by using clustered standard errors in all estimations with clusters at the individual level.

In general, the effects of informal eldercare on labor market outcomes could vary between countries or between groups of countries with different cultural norms or institutional regulations (Kotsadam 2011). Studying country-specific differences more closely would go beyond the scope of this paper and data availability. Since we concentrate on the effect of caregiving in different time periods, we need to observe a sufficient number of individuals who have provided care in each time period as well as for consecutive time periods. For this reason, we pool all countries and estimate (European) sample averages instead. Nevertheless, the included country and wave fixed effects account for varying institutional settings between countries and waves. As a robustness check we further reestimate the equations (1) – (3) excluding one country at a time. Results are stable even if single countries are omitted from the regression, which indicates that our results are not driven by any specific country in the sample. The results are presented in Figure A2 in the Online Appendix.

Since some characteristics, such as the individual's level of altruism, attachment to the labor force, or emotional closeness to the parent but also

outside circumstances such as access to support and job flexibility, are not observable (at least not in our dataset), we apply an instrumental variables (IV) approach as a robustness test to check for potential endogeneity concerns.[12] While most studies do not find evidence of endogeneity, weak instruments are often a problem (Van Houtven, Coe, and Skira 2013). To find causal effects in the presence of endogenous explanatory variables, we need to find a set of instruments that is sufficiently correlated with the caregiving variable but should affect the labor market outcome only through the channel of caregiving. If these assumptions hold, we can use the exogenous variation of the instruments in a two-stage least square (2SLS) approach to yield unbiased estimates (Angrist and Pischke 2009). We limit the analysis to recent caregiving since we believe potential endogeneity concerns are strongest for participating in the labor market and caregiving simultaneously. Since past caregiving activities are not considered in this analysis, we estimate the effect of any recent parental caregiving (CG_r) on labor force participation, rather than the effect of only recent caregiving.

The 2SLS estimator uses the exogenous instruments to predict the endogenous variable in a first-stage regression:

$$CG_r = \eta + \rho Z + \mu X + \upsilon. \tag{4}$$

In the second stage the predicted values of the first stage (CG_r) are used as regressors to replace the endogenous variable.[13] The vector Z includes two additional instruments. Following Courtney H. Van Houtven, Norma B. Coe, and Meghan Skira (2013), we use a proxy for parents' informal care demand, namely an indicator for whether at least one of the parents suffers from "poor" or "fair" health.[14] In addition, we use the number of living sisters of the respondent, which indicates whether other possible informal caregivers exist. Our instruments capture the extent of the parents' need for care from the adult child in our sample. The IV estimates hence measure the effect of recent caregiving as a result of an increase in parental need for care on the adult child's labor force participation. However, conditional on our control variables, our instruments are unlikely to have a direct effect on the adult child's labor force participation.

RESULTS

We start the analysis by only looking at recent caregiving to test for potential endogeneity concerns. In Table 2 we report the results for the regressions of recent caregiving and our additional explanatory variables on labor force participation using 2SLS and OLS estimation for women (part I) and men (part II). In line with most of the literature, we cannot reject exogeneity with respect to the labor supply outcomes. The joint F-statistics of our

instruments are far above 10, hence this result is not due to weak instrument problems. We therefore interpret the OLS results as causal effects. All estimates denote marginal effects at mean values. As we us the log of the number of hours, the results should be interpreted as semi-elasticities, meaning the coefficients indicate percentage changes.

Similar to previous studies, we find a slightly negative relationship between recent caregiving and labor force participation for women. Recent caregiving reduces the probability of being currently employed by 5.0 percentage points, while working hours are reduced by 8.2 percent on average. Since we look at mature caregivers, some of the employment exits may be explained by retirement. The probability of being retired increases by 2.5 percentage points for recent caregivers, however, this effect is only statistically significant at the 10 percent level. While the point estimate is negative, the effect of recent caregiving on full-time work is not statistically significant at conventional levels.

The corresponding results for caregiving men are shown in part II of Table 2. As seen in Table 1, men are less likely to be caregivers than women. In addition, parental need for care is not as strong of an indicator for care provision. Still, the joint F-statistics of the instruments exceed 10 and exogeneity of caregiving cannot be rejected, hence we again interpret the OLS results as causal effects.[15] Recent caregiving reduces the employment probability for men by 12 percentage points. A part of this reduction might again be explained by retirement. Recent caregivers are on average 4.5 percentage points less likely to be retired than men who did not provide care recently. However, unlike women, men's paid working hours are, on average, not affected by caregiving. Since men typically work full-time, the explanatory power of the regressions for hours worked and full-time work is low in general.

Next, we consider only recent, only past, and continuous caregiving simultaneously to account for the fact that about half of recent caregivers have also provided care in the past. The results are shown in Table 3. For comparison, probit results are shown in Table A9 in the Online Appendix. The qualitative results remain unchanged. Since we could not reject exogeneity for recent caregiving, we do not expect endogeneity to be a concern with respect to past caregiving.[16] Past caregivers might be more likely to be a caregiver in the current period as well because their parents might still be in need for help. In this case, past and recent caregiving are highly correlated and the results in Table 2 might not represent the true effects of recent caregiving on labor market outcomes. After the care period has ended, caregivers might find it difficult to reenter employment or find a new job, for example, due to labor market frictions. Controlling for only recent or past caregiving and including an indicator for continuous caregiving serves to disentangle these effects. The results can be interpreted as follows: If a person is only a recent caregiver but not a past caregiver,

Table 2 The effects of recent caregiving on labor force participation

(I) Women	*IV: Employed*	*OLS: Employed*	*IV: Log(hours)*	*OLS: Log(hours)*	*IV: Retired*	*OLS: Retired*	*IV: Full-time*	*OLS: Full-time*
Recent caregiver	– 0.145	– 0.050***	– 0.024	– 0.082**	0.108	0.025*	– 0.020	– 0.030
	(0.146)	(0.016)	(0.302)	(0.032)	(0.117)	(0.013)	(0.260)	(0.024)
Obs.	8119	8119	4448	4448	8119	8119	4448	4448
*R*2		0.34		0.14		0.44		0.15
First stage F-Stat.	46.38		21.16		46.38		21.16	
Endog. test (*P*-val.)[a]	0.509		0.975		0.415		0.966	
Overid. test (*P*-val.)[b]	0.963		0.267		0.364		0.993	
(II) Men	*IV: Employed*	*OLS: Employed*	*IV: Log(hours)*	*OLS: Log(hours)*	*IV: Retired*	*OLS: Retired*	*IV: Full-time*	*OLS: Full-time*
Recent caregiver	– 0.066	– 0.120***	– 0.425	0.026	0.364	0.045**	– 0.129	0.012
	(0.283)	(0.025)	(0.531)	(0.041)	(0.260)	(0.022)	(0.346)	(0.027)
Obs.	5640	5640	3619	3619	5640	5640	3619	3619
*R*2		0.34		0.09		0.44		0.10
First stage F-Stat.	16.20		11.09		16.20		11.09	
Endog. test (*P*-val.)[a]	0.990		0.320		0.222		0.673	
Overid. test (*P*-val.)[b]	0.051		0.322		0.577		0.365	

Notes: Significance levels are clustered on individual level: ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively. All regressions control for socio- demographic and health information and include country and wave fixed effects. [a]Durbin-Wu-Hausman; [b]Sargan-Hansen test of overidentifying restrictions.

Source: SHARE, own calculation.

Table 3 The effects of recent and past caregiving on men's labor force participation

	Women				*Men*			
	Employed	*Log(hours)*	*Retired*	*Full-time*	*Employed*	*Log(hours)*	*Retired*	*Full-time*
Recent caregiving only	– 0.054***	– 0.0460	0.055***	– 0.018	– 0.076***	0.024	0.014	0.004
	(0.018)	(0.036)	(0.015)	(0.028)	(0.027)	(0.039)	(0.022)	(0.026)
Past caregiving only	– 0.038**	– 0.066**	0.027*	– 0.062**	– 0.064**	– 0.013	0.029	– 0.029
	(0.018)	(0.033)	(0.014)	(0.028)	(0.025)	(0.043)	(0.023)	(0.030)
Continuous caregiving	– 0.048**	– 0.137***	0.014	– 0.067**	– 0.140***	0.051	0.075**	0.044
	(0.020)	(0.047)	(0.017)	(0.032)	(0.038)	(0.044)	(0.034)	(0.034)
Obs.	9543	5194	9543	5194	6752	4252	6752	4252
R^2	0.33	0.14	0.45	0.15	0.35	0.08	0.46	0.10

Notes: Significance levels are clustered on individual level: ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively. All regressions control for socio- demographic and health information and include country and wave fixed effects.
Source: SHARE, own calculation.

this effect is measured by the regressor *Only recent caregiver*. Accordingly, if a person is only a past caregiver but not a recent caregiver, this effect is measured by the regressor *Only past caregiver*. Lastly, if a person is both a past and a recent caregiver, this effect is measured by the regressor *Continuous caregiver*.

Looking at the different caregiving effects, we find: Only recent caregiving reduces women's employment probability by 5.4 percentage points, only past caregiving reduces it by 3.8 percentage points, and continuous caregiving reduces it by 4.8 percentage points. In addition, only recent caregiving increases the probability of being retired by 5.5 percentage points. While the effect of only past caregiving is much smaller (2.7 percentage points) and only marginally significant, continuous caregiving has no effect. Though the point estimate is still negative, we do not find a significant effect of only recent caregiving on paid working hours or the probability of working full time. However, continuous caregiving reduces working hours by, on average, 6.6 percent and full-time employment by 6.7 percent, respectively. While, ex ante, the duration of a person's care needs is typically uncertain, a possible explanation for this finding is that women who anticipate to care for an extended period of time have a higher incentive to try to combine work and caregiving, or that combining paid work and caregiving is especially important for longer care periods to secure a steady income. Hence, one strategy would be to reduce paid working hours and work part time. Alternatively, an adjustment of paid working hours might take some time to implement. Indeed, we find only past caregiving to reduce women's paid working hours by 6.6 percent on average and the probability of full-time employment by 6.2 percentage points. The non-negligible effects of only past caregiving could also indicate that women are not able to easily increase their working hours again after a care period has ended due to labor market frictions.

A somewhat different pattern is observed for men. Only recent caregiving, only past caregiving, and continuous caregiving reduce employment probability by 7.6, 6.4, and 14.0 percentage points, respectively. Hence, the effects for men are much larger than those for women, and the effect for continuous caregiving dominates. Besides, continuous caregivers are 7.5 percentage points more likely to be retired, while only recent or past caregiving alone do not affect the retirement probability. Moreover, we do not observe any effects of caregiving on men's paid working hours. Since men more often work in full-time positions (as can be seen in Table 1), they might be less flexible to reduce working hours than women. Our results thus show that while, on average, women react to continuous care periods by adjusting paid working hours and only to a lesser extent by leaving employment, men are more likely to exit the labor market – often into retirement.

DISCUSSION AND CONCLUSION

Providing sufficient long-term care to the elderly is a major policy challenge in our aging societies. The majority of long-term care is provided by informal caregivers who contribute a substantial amount of their time to the task (Colombo et al. 2011). In this paper, we analyze how intensive, that is, daily, care provision to parent affects mature caregivers' labor market outcomes, and we analyze the short- and medium-term effects of caregiving in European countries. Our results show that, for the average caregiver, caregiving comes at the cost of reduced employment rates and, for women, also reduced paid working hours. While for women, the negative employment effect of recent caregiving dominates, it is especially continuous caregiving and, to a lesser extent, only past caregiving that leads to a reduction of women's paid working hours as well as full-time employment. The negative effect of caregiving on paid working hours hence increases with the duration of caregiving, and women who stopped providing care still suffer, on average, from negative labor market outcomes with respect to hours and employment. Men's employment probability is even more affected by only recent, only past, and continuous caregiving, but caregiving does not affect men's paid working hours. On average, men thus suffer more negative effects of caregiving with respect to employment but not with respect to working hours.

Our findings offer two possible explanations. First, women, who more often work part- time than men, might find it easier to reenter or stay in the labor force working only a few hours. Part-time work is generally also more prevalent in low-skilled jobs where breaks in employment history might not pose as much of a barrier to entry as in traditionally male-dominated full-time or high-skilled positions. Second, women provide care more frequently. Employers might therefore consider women's caregiving as the norm, while caregiving men might be regarded as less career driven and less committed to the job.[17] As a consequence, an employer might view a break in employment due to caregiving of a male employee more negatively than of a female employee.

Our results suggest that, especially if care periods are longer, women, on average, have the possibility to reduce paid working hours, which could allow them to combine labor market participation and care obligations. However, this flexibility might come at the cost of less tenure security, which is also more prevalent in part-time positions (Tijdens 2002). In contrast, it seems that men are, on average, less flexible with respect to paid working hours and leave the labor market completely. Possibly, men more often qualify for early retirement options or only take on continuous care responsibilities once they have reached the official retirement age. Since men usually have more continuous work trajectories, they might also be more independent financially.

In view of growing long-term care needs, policymakers should pay particular attention to reducing financial risks for informal caregivers by facilitating a return to full-time work after an episode of working part-time or by implementing paid care leave options. Greater work flexibility at all hierarchical levels and greater societal acceptance for care work might especially allow more men to become informal caregivers. Moreover, to assess potential obstacles of policy efforts to increase labor force participation of older individuals, understanding whether informal caregiving affects labor force participation beyond short-term effects, becomes increasingly important. It would therefore be interesting to look more closely at the policies implemented in different countries to improve our understanding of which measures facilitate the compatibility of paid work and informal caregiving in the future. However, data requirements for such research are extremely high because individuals need to be repeatedly interviewed over time and, at present, a further subdivision of our sample by countries or groups of country would result in an insufficient sample size for a reliable analysis. We therefore leave this analysis for further research as additional data becomes available.

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NOTES

[1] Intensive caregiving may refer, for example, to the number of hours of caregiving, activities performed or care recipients, being an immediate relative to the care recipient or having no caregiving substitutes, and is generally associated with a high frequency of care (Lilly, Laporte, and Coyte 2007).

[2] DOIs: 10.6103/SHARE.w1.600, 10.6103/SHARE.w2.600, 10.6103/SHARE.w4.600, 10.6103/SHARE.w5.600, 10.6103/SHARE.w6.600. Wave 3, a retrospective survey, has been excluded since it does not contain relevant caregiving variables. The SHARE questionnaires and data are available at www.share-project.org. 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, SHARELIFE: 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).

[3] Data is collected using a computer-assisted personal interviewing technique. Sample selection varies across countries from simple random selection of households to multi-stage designs due to varying institutional conditions regarding sampling (Börsch-Supan and Jürges 2005). For further methodological information see Frederic Malter and Axel Börsch-Supan (2013, 2015).

[4] Exploiting the panel structure and allowing for random effects yields similar results.

[5] In wave 2, respondents are asked whether they have provided care since the last interview, which corresponds to approximately twenty-four months.

[6] Individuals are asked if they provide regular help. They are informed that "By regularly we mean daily or almost daily during at least three months. We do not want to capture help during short-term sickness of family members."

[7] Daily parental caregivers who also provide care to another individual are still included in order to not further reduce sample size. However, very few caregivers (7.8 percent of women and 6.2 percent of men current caregivers) also provide daily care to a person other than a parent. Within the group of continuous daily parental caregivers, 9.5 percent of women and 4.5 percent of caregiving men also provide daily care to a person other than a parent in the past period, while 8.6 percent of women and 3.9 percent of caregiving men also provide daily care to a person other than a parent a parent in the current period.

[8] Defining employment in this fashion is our preferred definition since it captures whether an individual receives income from work. Only including employed or self-employed individuals based on self-assessed labor market participation leaves our qualitative findings unchanged.

[9] See the OECD glossary at https://stats.oecd.org/glossary/detail.asp?ID = 3046.

[10] The country- and sex-specific effective retirement age is based on OECD (2015).

[11] We abstract from the subscripts i and t in all equations.

[12] The IV approach would also address potential reverse causality problems if individuals decide to care for their parents because they retired or have lost their jobs and have low chances of receiving new job offers again (Heitmueller 2007).

[13] The second stage equation of 1 would thus be given by $L_{IV} = \alpha_{IV}{}^{L} + \beta_{IV}{}^{L}\boldsymbol{G}_r + \lambda_{IV}{}^{L}X + u_{IV}{}^{L}$.

[14] This measure is based on the respondents' assessment of their parents' health. The possible categories for parental health changed from "very good," "good," "fair," "poor," and "very poor" in wave 1 to "excellent," "very good," "good," and "poor" in succeeding waves. Hendrik Jürges, Mauricio Avendano, and Johan P. Mackenbach (2008) show that combining the categories "poor" and "very poor" as well as "excellent" and "very good" results in a consistent measure of health.

[15] In the employment regression, the test of the overidentifying restrictions rejects the null hypothesis of valid instruments. We reestimate the 2SLS equation replacing the instrument "number of sisters" with an indicator for whether a respondent has any sisters. The results affirm our decision for OLS: We cannot reject that the excluded instruments are correctly excluded from the estimated equation (p-value: 0.262), and the point estimate of the effect of recent caregiving on employment (-0.235) remains statistically insignificant (p-value: 0.377).

[16] OLS hence remains our preferred specification. While, in theory, we could use, for instance, poor or fair health status of a parent in the past period as additional instrument in this setting, the strength of this extended instrument set is extremely weak with F-statistics far below 10.

[17] Related, Laurie A. Rudman and Kris Mescher (2013) find that men who request parental leave are viewed as weak, which in turn may lead to employment discrimination (Moss-Racusin, Phelan, and Rudman 2010).

SUPPLEMENTAL DATA

Supplemental data for this article can be accessed at https://doi.org/10.1080/13545701.2020.1786594.

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