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Informal adult care and caregivers' employment in Europe

Emanuele Ciani *

Department of Economics, University of Essex, Wivenhoe Park, Colchester, United Kingdom

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ABSTRACT

I discuss instrumental variable estimates of the effect of providing unpaid adult care on the caregivers' probability of being employed, using eight waves of the European Community Household Panel. I focus on men aged 40–64 and women aged 40–59 from thirteen Member States, aggregated in two groups of Northern-Central and Southern countries. Previous papers with European data found that IV estimates are more negative than estimates assuming exogeneity of caregiving. I show that this difference is not robust once account is taken of time-invariant unobserved heterogeneity. Indeed, instruments turn out not to be needed, and the estimated effect is negative, but small in both groups of countries.

1. Introduction

While most economic analyses of caregiving focus on childcare, there is growing interest in the provision of unpaid (informal) care of elderly or impaired adults by relatives and friends. Although the empirical research originated in the United States, European literature on this topic has increased during the last decade.[1] The main reason is that, in common with many OECD Countries, the EU has a high and growing old age dependency rate, defined as the population aged 65 or more divided by total population aged 15–64.[2] It is not clear who will care for this increasingly dependent population because welfare systems still rely to some extent on the unpaid assistance provided by the family. Moreover, if the burden of care on the working age population increases, policy makers will be interested in the socio-economic conditions of the informal caregivers themselves, about which relatively little is known. One of the most relevant questions is whether unpaid care-giving will subtract time from leisure or work.

It is therefore of great interest to investigate empirically if providing unpaid care to adult relatives or friends affects the caregivers' probability of being employed. However, estimation is complicated by the presence of unobservable factors that may affect both choices. Individual unobserved characteristics, such as ability, may influence both willingness to work and the relative cost of providing informal care with respect to paying for professional nursing. In addition, unexpected changes in labor market opportunities, not observed by the researcher, may have an influence on both. While the use of standard fixed effects estimation can help take into account time-invariant unobserved heterogeneity, it does not remove the bias originated by the latter source of endogeneity. One solution is to use an instrument for informal caregiving, i.e. a variable which is expected to influence the decision on providing assistance to impaired individuals, but which has no direct effect on labor supply. This is what is done in this paper, using a sample of men aged 40–64 and women aged 40–59 extracted from eight waves for 13 countries of the European Community Household Panel (ECHP). Following part of the literature, such as Heitmueller (2007), I instrument care-giving with the presence of disabled or in poor health household members.

Previous research using different European data estimated that the negative effect of providing informal care on the caregivers' probability of being employed could be as large as 50% if instrumental variables (IV) were used to deal with endogeneity (Crespo, 2007; Heitmueller, 2007; Crespo and Mira, 2010). However, using the ECHP, I show that the result is not robust once account is taken of

* Tel.: +44 1206 874124; fax: +44 1206 872724.
E-mail address: eciani@essex.ac.uk.

[1] With respect to the United States literature, here not discussed, see Wolf and Soldo, (1994) and Pezzin and Schone (1999), among others.

[2] Eurostat predicts the rate for the EU-27 will double from 25.9% in 2010 to 50.4% in 2050. Data available on the Eurostat website, last access 7/5/2010.

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time invariant unobserved heterogeneity. Indeed, although I find a significant but small negative effect in the observed thirteen Member States, time variant unobserved heterogeneity, which motivates instrumental variable estimation, does not seem to constitute a problem for this dataset.

In the next section I provide a brief model to explain how the effect of informal care can be interpreted and estimated, and I link it with the available empirical literature. The third section describes the derivation of the sample from the ECHP. The fourth discusses descriptive differences between care-givers and the rest of the population. The fifth and last section presents econometric methods and discusses the main results. Conclusions follow.

2. A model of informal care and labor supply

A simple static model of labor supply, similar to Wolf and Soldo (1994) and Crespo and Mira (2010), can help illuminate the endogeneity problems in estimating the effect of providing adult informal care on the probability of being employed. To simplify, I assume that the individual faces an exogenous demand for care that is a function d of the health status H of his or her relatives. One measure available in many surveys, including the ECHP, is the presence of disabled or in poor health household members.

Suppose that the individual must satisfy this demand, but can choose between providing formal (in hours h^{FC}) or informal (h^{IC}) care. The first has to be bought on the market for professional services at price p^{FC}, whereas the second consists of direct unpaid assistance by the carer. The amount of informal and formal care to be provided can be implicitly defined by the equation $g(h^{IC},h^{FC})\geq d(H)$, where H is exogenously fixed and g is a standard concave production function. Given the hourly market wage, the optimal choice for leisure L, consumption C, h^{IC} and h^{FC} follows[3]

$$\max_{L,C,h^{IC},h^{FC}} U(C,L)$$

$$\text{s.t. } C+wL\leq w\left(T-h^{IC}\right)+y-p^{FC}h^{FC}$$

$$g\left(h^{IC},h^{FC}\right)\geq d(H)$$

where T is total time available, y is non earned income, and U is the (individual) utility function, assumed to be increasing in L and C and concave. The optimal choices for h^{FC} and h^{IC} depend on their costs. This is p^{FC} for the former, while the opportunity cost of providing one additional hour of informal care is equal to the current wage w for the employed and to the marginal utility of leisure for the unemployed.

Given the optimal choices for h^{IC} and h^{FC} we can thus derive the reservation wage as

$$w^{r}=\omega\left(T-h^{IC},\ y-p^{FC}h^{FC}\right). \tag{1}$$

Purchase of formal care, which we can define as $e^{FC}\equiv p^{FC}h^{FC}$, has an effect on the reservation wage because it shrinks total income. Conversely, providing unpaid care affects labor supply through a reduction in the number of hours available for leisure and work. It would therefore be interesting to estimate this effect. Suppose that we have data from a survey that observed individuals for a fixed number of years, indexed by $t=1,\ldots,T$. For each year, the respondents were asked to report whether they were employed (binary variable $LS_{it}=1$) or not ($LS_{it}=0$), and to provide information on a set of demographic variables x_{it}, on the health of his/her relatives H_{it},on the hours of informal care h_{it}^{IC} and on the expenditure on formal care e_{it}^{FC}.

It follows from the model that LS_{it} depends on the comparison between the current or offered wage w_{it} and the reservation wage w_{it}^{r}:

$$LS_{it}=1\left[w_{it}>w_{it}^{r}\right]. \tag{2}$$

Given w_{it}, I can model LS_{it} conditional on y_{it}, w_{it}, h_{it}^{IC} and e_{it}^{FC} (expenditure on formal care), specifying a linear reduced form for the reservation wage

$$LS_{it}=1\left[w_{it}>\alpha_0+\alpha_1 y_{it}+\alpha_2 h_{it}^{IC}+\alpha_3 e_{it}^{FC}+\eta_{it}\right] \tag{3}$$

where the error η_{it} is independent from the explanatory variables by construction.

If w_{it} and y_{it} are not observable for all individuals, for example because they are not employed, I can opt for a reduced form

$$y_{it}=\gamma_{10}+x_{it}\gamma_{11}+c_{1i}+\theta_{1it} \tag{4}$$

$$w_{it}=\gamma_{20}+x_{it}\gamma_{21}+c_{2i}+\theta_{2it} \tag{5}$$

where c_{1i} and c_{2i} are time invariant unobserved individual effects, while θ_{1it} and θ_{2it} are error terms uncorrelated with x_{it}, c_{1i} and c_{2i} by construction. Note I am assuming that h_{it}^{IC}, e_{it}^{FC} and H_{it} can be excluded from both. The latter is particularly restrictive, and it is further discussed below. Substituting for both y_{it} and w_{it} in Eq. (3), we get[4]

$$LS_{it}=1\left[\alpha_0^{*}+x_{it}\alpha_1^{*}-\alpha_2 h_{it}^{IC}-\alpha_3 e_{it}^{FC}+c_i+\nu_{it}>0\right] \tag{6}$$

$$c_i=-\alpha_1 c_{1i}+c_{2i}\ ;\ \nu_{it}=-\alpha_1\theta_{1it}+\theta_{2it}-\eta_{it}. \tag{7}$$

Part of the European literature (Casado-Marín et al., 2009; Michaud et al., 2010; Viitanen, 2010; Crespo and Mira, 2010) has focused on estimating some version of Eq. (6) where h_{it}^{IC} is replaced by a dummy IC_{it} for the individual providing informal care

$$LS_{it}=1\left[\alpha_0^{*}+x_{it}\alpha_1^{*}-\alpha_2^{*}IC_{it}-\alpha_3 e_{it}^{FC}+c_i+\nu_{it}>0\right]. \tag{8}$$

I will follow this choice, in order to make my results comparable to this stream of research. This is also motivated by the fact that h_{it}^{IC} is available only as a categorical variable in the first wave of ECHP.

Rather than focusing on α_2^{*}, the effect of IC_{it} on LS_{it} can be better expressed by:

$$\begin{aligned} m\left(x_{it},e_{it}^{FC},c_i\right)=&Pr\left(LS_{it}=1\middle|IC_{it}=1,x_{it},e_{it}^{FC},c_i\right)\\ &-Pr\left(LS_{it}=1\middle|IC_{it}=0,x_{it},e_{it}^{FC},c_i\right). \end{aligned} \tag{9}$$

Of interest is the average treatment effect (ATE) of providing care on the probability of being in employment. Formally, it is the average of $m(\cdot)$ across the joint distribution of the observables and the unobservable c_i. This ATE is representing only part of the story, and a policy maker may be interested rather in the effect of formal care price, or in the total effect of the presence of relatives in need of care.[5] The focus on informal care is justified by the fact that it might be preferable for these individuals to be cared, at least in part, by family members. However, it is important to know whether this care might have a strong negative effect on caregivers' labor supply.

Some papers have used the ECHP to estimate the effect of IC on employment (Spiess and Schneider, 2003; Casado-Marín et al., 2009; Viitanen, 2010; Kotsadam, 2011), trying to account for time-invariant unobserved heterogeneity and for state dependence in LS.

[3] C is a composite commodity with price normalized to one. We also need $L+h^{IC}\leq T$.

[4] Where $\alpha_0^{*}\equiv-\alpha_0-\alpha_1\gamma_{10}+\gamma_{20}$, and $\alpha_1^{*}\equiv\gamma_{21}-\alpha_1\gamma_{11}$.

[5] I thank an anonymous referee for pointing this out.