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The Wage Elasticity of Informal Care Supply: Evidence From the Health and Retirement Study

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Abstract

This paper focuses on the wage elasticity of informal care supply to elderly parents employing an instrumental variable approach to account for the fact that the wage rate is likely to be correlated with omitted variables. Using the 1998 wave of the Health and Retirement Study, the wage elasticity of informal care supply is estimated to be negative and larger in magnitude than found previously. The lower bound of this elasticity is estimated to be -1.8 for males and -3.6 for females. Additional findings suggest that this wage elasticity differs by the type of care provided to elderly parents, and that it is larger in magnitude among individuals with siblings and those with independently living parents. Overall the reductions in the informal care constitute about 18% of the labor supply response for men and about 56% of the labor supply response for women, which are not compensated by monetary transfers.

1 Introduction

For the past two decades the policy debate on issues related to the aging population has been growing at unprecedented rates throughout the world. On the one hand, policy measures suggested in the debate include removal of the disincentives for labor force participation for near elderly (CBO 2004, U.S. DHHS 1997, Apfel 2004). This would have effectively raised the wage rate faced by the targeted group, as in the case of the elimination of the Social Security earnings test for those older than 65 in the United States (Friedberg 2000). On the other hand, the role of informal caregiving is emphasized as a means to "keep many individuals at home who would otherwise require expensive institutional care" (U.S. DHHS 1997, p.6). Policies targeting these two objectives may turn out to conflict with each other: higher wages may decrease hours devoted to informal care for elderly parents, while policies encouraging informal care may lead to fewer working hours. Research on the effects of the Social Security earnings test mostly focuses on labor supply and claiming behavior of the affected group (Haider and Loughran 2008; Baker and Benjamin 1999; Burtless and Moffitt 1984; Friedberg 2000; Gruber and Orszag 1999) with little attention paid to the potential interaction between incentives for paid employment and caregiving choices. This interaction may have adverse implications for the well-being of the oldest old, given that the prevalence of caregiving is highest among individuals in their late mid-life.

Central to the analysis of this interaction is the concept of the wage elasticity. The labor supply literature suggests a positive wage elasticity of labor supply (smaller for males, larger for females). Therefore, if the wage elasticity of informal care supply is close to zero (as has been found in earlier studies), higher wages would lead to more labor supplied with negligible effects on the provision of informal care. In this case one might hope that benefits from increased labor supply will not be offset along other dimensions. If, on the contrary, the wage elasticity of informal care supply is relatively large and negative, one should be more cautious when evaluating the effects of fiscal policies on labor supply among individuals in their late mid-life. A substantial negative wage elasticity of informal care supply would mean that along with increasing labor supply near elderly would cut back on the hours of informal care they provide to

their elderly parents. This may potentially lead to more people turning to the government in their quest for help with covering formal long-term care costs.

The goal of this paper is to study the wage elasticity of informal care supply and contribute to the literature by directly addressing the issue of omitted variables in the time allocation and monetary transfer equations. Informal care supply is defined as annual time spent helping elderly parents with basic personal needs as well as household chores, errands, and transportation. This paper uses a unique opportunity of access to the restricted geographic identifiers for the Health and Retirement Study (HRS) respondents to instrument hourly wages with the industry structure in the state of residence allowing for differential impact by education.[1]

The main finding of the paper suggests that the wage elasticity of informal care supply is negative and substantially larger in magnitude than previously estimated. Due to the weakness of the instruments there is still a significant remaining bias in the estimates of the wage elasticity. However, since the direction of the bias is the same as in the OLS, the obtained estimates can be treated as upper bounds of the true (more negative) elasticities. For example, according to the current estimates a 10 percent increase in wages translates into an 18 percent decrease in average informal care provided by males and 36 percent decrease in average informal care provided by females. Additional findings include the following: (i) the wage elasticity of informal care supply is more negative for people who have at least one sibling and those who have no parent living with them and/or in a nursing home; (ii) the wage elasticity of help with personal needs is less negative than the wage elasticity of time spent helping parents with chores, errands, transportation, etc.; (iii) estimates of the wage elasticity of net monetary transfers do not support the hypothesis that individuals replace time transfers to parents with monetary transfers as their wages go up.

The paper is organized in the following way. Section 2 presents some background information, followed by the econometric specification in Section 3. Data is described in Section 4. Section 5 presents the empirical findings and a discussion of some extensions to the main analysis of informal care supply. Section 6 concludes.

2 Background

Thus far, the studies of informal care supply to elderly parents have been mostly descriptive even though this area is receiving growing attention in various social science disciplines. In economics a considerable body of research has been developed on the motivation behind intergenerational transfers (for the most recent survey concerning motivation for financial transfers see Norton and Van Houtven (2006)) and some on residential decisions, while sociologists, for instance, have focused on identifying the determinants of the incidence and intensity of informal care supply paying little attention to economic factors (Schkokkaert 2006). Several more recent works are devoted to the study of the relationship between formal and informal care. Van Houtven and Norton (2004) find that informal care reduces home health care use and delay nursing home entry, while Viitanen (2007) shows that an increase in higher government expenditures on formal care reduce the probability of informal caregiving outside the household. Other studies are also supportive of the fact that informal and formal care are substitutes (Bolin et al. 2007).

A few papers that consider the effect of changes in care giver's wages on time transfers to elderly parents study the trade-off between time and money dimensions of help using data from the Health and Retirement Study, the Panel Study of Income Dynamics, and the National Long-Term Care Survey of Informal Caregivers (Sloan et al. 2002; Zissimopoulos 2001; Ioannides and Kan 1999; Sloan et al. 1997; Couch et al. 1999). The results from these studies suggest that the effect of wages on informal care is not significant, either economically or statistically, while the wage impact on gross monetary transfers from adult children to their parents is positive and significant. The estimates of the wage elasticity of informal care supply range from -0.78 to 0.07 (see Table 1). However these estimates may be subject to an omitted variable bias. An upward bias from omitted variables may explain small magnitudes of the wage elasticities estimated earlier. For example, some people may be more productive in everything they do, which is difficult to control for with a conventional set of variables available to researchers. Therefore, these people would provide more care, but also would be rewarded in the

market with higher wages. As a result, the estimated wage effect in such a case would be upward biased, i.e. less negative.

In contrast to the scarcity of research on the wage elasticity of informal care supply, there is a large literature that has been devoted to the study of the wage elasticity of labor supply. There exist several generations of research in this area and they are extensively reviewed by Pencavel (1986, 1998, 2002), Killingsworth and Heckman (1986), Mroz (1987), and Blundell and MaCurdy (1999) in an attempt to document the variation in the estimates found and determine the sources of these differences. The overall conclusion from this literature is that the wage elasticity of labor supply is positive and is larger for females than for males, although converging over time (Schwabish 2002; Heim 2007).

3 Econometric Specification

Estimation Strategy and Specification

The theoretical framework underlying the empirical analysis is based on the simple one-period model of time allocation that involves two individuals: the care recipient and the care giver (Sloan et al. 2002). The care recipient refers to an elderly parent and the care giver to his/her adult child. This model starts with the idea that the caregiver maximizes her own utility that depends on her own consumption goods, leisure, and utility of the care recipient which in turn depends on consumption goods and care. The maximization is subject to the production of care, the time constraint and the standard budget constraints, with a possibility of monetary transfers between the parties. Care can be purchased in the market or produced using the caregiver's time. According to this framework, the allocation decisions of the caregiver as to the time for work and caregiving, monetary transfer, as well as purchased care will depend on the vector of prices (caregiver's wage and price of formal care), non-labor income, and socio-economic characteristics of the caregiver and the care recipient. Unfortunately, the data used in the empirical analysis do not provide any information on market-purchased help by care recipients or

prices they face, thus reducing the system to three equations[2]:

$$t_{gi}^{*} = \alpha_g log\ w_i + X_i\beta_g + u_{gi} \tag{1}$$

$$t_{gi} = max(0, t_{gi}^{*})$$

$$t_{wi} = \alpha_w log\ w_i + X_i\beta_w + u_{wi} \tag{2}$$

$$D_i = \alpha_D log\ w_i + X_i\beta_D + u_{Di} \tag{3}$$

where t_{gi} is annual hours of informal care for elderly parents, t_{wi} = annual working hours, D_i = annual net money transfer to elderly parents, w_i = individual's hourly wage rate, and X_i is a vector of controls for individual i, discussed later.

The wage effect on informal care supply is estimated using the Tobit model, as in most of the studies on informal care supply[3], to incorporate corner solutions into the estimation. A linear-log specification is chosen for the labor supply and money transfer equations.[4] All three equations are estimated separately for men and women. Since the model has three equations with identical regressors, generalized least squares for the system of linear equations produces as efficient estimates as the ordinary least squares equation-by-equation (Greene 2000, 616). However, a complication arises due to the fact that not all of the equations in the system are linear. Bhattacharya (2004) shows that in the case of the binary dependent variable, the joint estimation produces more efficient estimates. No study investigates the case of the limited dependent variable that follows the Tobit model. So it is assumed that in general the estimation equation-by-equation of the model with two linear and one Tobit equations would be less efficient, but still consistent, as is the case with the system of linear equations or binary outcomes.

Econometric Issues with the Wage Effect Estimation

If the hours of informal care are jointly determined with the hours of labor supply then wages are expected to be endogenous (see Carlin (2001) for similar discussion on volunteer labor supply). Some of the factors that enter Equations (1)-(3) are not available in the data. For

example, information on some of the important determinants of the informal care supply, such as the price of formal care as well as unobserved personality traits related to productivity in caregiving and willingness to help others (responsibility, respect for seniors, etc.) is usually not available to researchers. Lack of this information is likely to lead to the problems associated with *omitted variables*. The estimates of the wage elasticity of informal care supply would not be biased if the assumption of zero correlation between wages and omitted variables were plausible, and the equation was linear. However, in the current setting this is not true. For example, the price of formal care is likely to be higher for people living in high-wage areas, and failure to control for this would result in an upward biased estimate of the wage effect on informal caregiving time. Similarly, the productivity in caregiving may be positively correlated with the productivity on the job leading to an upward bias in the wage effect estimate. This upward bias can explain the close to zero estimates of the wage effect on informal care supply in the earlier studies.

The omitted variable problem in the caregiving analysis is similar to that found in estimating standard labor supply elasticities. Over the last few decades a number of attempts have been undertaken to use different instrumental variables in the labor supply setting. Pencavel (1986) mentions sets of instruments used in the early literature which have since been disqualified (Mroz, 1987). These include such variables as own education, experience, and the reported hourly wage rate used to instrument the wage rate calculated from earnings and hours. Somewhat controversial instruments are education of parents and their socio-economic status, lagged values of the wage rate, urban residence indicator, and polynomials in age and education. Sets of aggregated information such as unemployment rates and industry structure in the region of residence, cohort average schooling, other group level variables, and polynomials in regional and time trends have been shown to be better instruments (Pencavel 2002; Senesky 2003; Bacolod 2007), as they have no impact on the labor supply but through wages. However, since these instruments are aggregate level variables, they are not very strong predictors of wages.

This study offers a novel set of both aggregate and individual level instruments for wages which is inspired by the literature investigating recent upward trend in earnings inequality. Factors

contributing to this trend have a differential impact on wages of less educated versus more educated workers. Perhaps, two most influential factors include international trade and employment shifts from goods-producing to service-producing industries. For example, Borjas and Ramey (1995) find that less educated workers in concentrated manufacturing industries experience larger negative impact of net imports than more educated workers. Through the outflow of less educated workers from concentrated to competitive industries, a qualitatively similar spillover effect is observed in competitive manufacturing industries. In addition, Blackburn (1990) finds that the wage inequality is higher in service-producing industries than in goods-producing industries. Therefore, the industry structure in the labor market should be able to explain wage differences among workers with different levels of education. These considerations justify the choice of the instruments.

The instrumet set includes state unemployment rate and state industry structure described by the percentages of the working population employed in each of the services, government, and three manufacturing sectors – trade-impacted concentrated industries, competitive industries, and other durables industries[5] and interactions of these aggregate variables with the education level of respondents. The assumption behind this choice of instruments is that they reflect only the labor demand conditions and are not related to the choice of hours spent on various activities (labor, caregiving) directly or through omitted variables. Regional dummies are included to control for such factors as formal care opportunities and prices.[6]

The analysis is based on the sample of near elderly working individuals who are at risk of providing care for their elderly parents, i.e. their parents are still alive. The focus on near elderly is justified by the fact that the fraction of women providing care is highest among the 45-64 age group [near elderly]: 13 percent compared to 10 percent for women of 30-44 years old and 7 percent of women 65 years old or older (Commonwealth Fund's (1999) report cited in McGarry (2003)). Restricting attention to working individuals allows using the observed (actual or calculated for salaried workers) hourly wage rate without a need for an imputation (which often requires strong and arguable assumptions and exclusion restrictions). However, focusing on only

working individuals raises the issue of *selectivity bias*, for which there is some evidence in the empirical literature, although it is not conclusive.

In the context of intergenerational transfers, especially informal care, the selectivity issue may be serious if caregiving responsibilities draw people out of the labor force or into retirement. Some studies in sociology and gerontology do show that in general caregiving women are more likely to quit employment than non-caregiving (Dentinger and Clarkberg 2002; Pavalko and Henderson 2006), while others suggest no effect (Pienta 2003; Johnson and Favreault 2001; Coile 2004). Yet, others find that the effect depends on the residential status: caregiving responsibilities have significant impact on exit from the labor force only for women who co-reside with their elderly parents (Ettner 1995) and on weekly working hours in case of non-coresident parents (Ettner 1996). At the same time there is no effect of caregiving responsibilities on male labor supply measured as unconditional weekly working hours (Ettner 1996). The only direct test of the impact of caregiving responsibilities for elderly parents on retirement decisions is done by Kazi (2006) who shows that the potential parent care needs do not accelerate exit into retirement.

In the labor supply context, Mroz (1987) offers a comprehensive investigation of the sample of married women, the population group for which the selectivity issue has always been considered important. He finds that even in this case selection does not have a significant impact on the estimates of the wage elasticity of labor supply as long as labor market experience is not treated as an exogenous determinant of wages (i.e., as an instrument).

4 Data and Descriptive Analysis

The main analysis in this paper is implemented using the Health and Retirement Study (HRS) data from the 1998 wave.[7] The Health and Retirement Study is a national longitudinal survey of people born in 1947 and earlier providing a rich source of information on the lives of older Americans, including their health and economic status.

The analysis focuses on a cross-section of working individuals[8] who can potentially provide

time to their parents or parents-in-law (both are referred to as "parents" throughout the paper). In the present study parents are treated as a group, similar to Ioannides and Kan (2000). Year 1998 has been chosen as the year that allows the largest sample size of individuals with living parents possible among all the HRS waves.

Dependent Variables

The dependent variables used in the main analysis are annual working hours, annual hours spent helping parents with basic needs and household chores, and net annual monetary transfer to parents (gross transfer to parents minus gross transfer from parents). Annual working time is the product of usual weekly hours of work and number of weeks worked across all jobs.

The questions concerning intergenerational transfers are asked as follows:

Now about help to and from parents...

1. *Not counting any shared housing or shared food, did you give financial help to your parents or parents-in-law amounting to $500 or more [since last interview, in the last two years]?*

How about another kind of help:

2. *Did you spend a total of 100 or more hours [since last interview, in the last two years] helping your (deceased) [parents] with basic personal activities like dressing, eating, and bathing?*

3. *Did you spend a total of 100 or more hours [since last interview, in the last two years] helping your (deceased) [parents] with other things such as household chores, errands, transportation, etc.?*

If the answer is "yes" to these questions, then the respondent is asked the amount of the transfer provided over the past two years. Overall, the effective annual time spent helping parents is defined here as the sum of the time spent helping parents with basic personal needs and time spent

helping parents with household chores. Although the question is asked so that the dependent variable should be left-censored at 50 hours a year, in practice, a considerable number of individuals reported time in caregiving smaller than 50 hours (112 out of 387 cases with positive care hours among males and 68 out of 495 cases among females). Thus, in the current analysis the lower limit on time use is set to zero. It should be noted that because of the two-year reference period, information on intergenrational transfers (time and money) is taken from the 2000 wave of the data, while explanatory variables - from the 1998 wave. It is assumed that individuals make transfer decisions for the period from 1998 to 2000 based on the information they have in 1998.

Explanatory Variables

The variable of interest - hourly wage rate - is taken directly if reported on an hourly basis.[9] Otherwise, it is constructed by dividing earnings from the main job over a certain time period (year, month, two weeks, week) by the standardized annual working hours to avoid the negative division bias.[10]

The set of individual controls in all specifications include the following: age, age squared, education, education squared, current non-wage income defined as capital income, household wealth, marital status, non-white, Hispanics, region dummies (Blundell and MaCurdy 1999), number of young children (0-6 years old), number of 6-18 year-old children (Mroz 1987), and number of siblings by gender, own and in-laws. The last variables aim to control for other possible time demands and availability of substitutes. Mulligan (1995) suggests the inclusion of health measures since disutility from work may increase as people age. Therefore, health measures may become significant determinants of labor supply, as well as of informal care supply, for older workers.

In addition to the individual characteristics, all of the specifications in the main analysis include characteristics of parents. These characteristics refer to the set of all living parents and include the number of surviving parents (maximum four), the ratio of the number of mothers to the number of living parents, the age of the oldest parent, the indicators if at least one of the parents (i) is single,

(ii) has a memory related disease, (iii) is a homeowner, and (iv) is identified by the respondent as being financially worse off or better off than the respondent. The indicator of whether there is at least one parent with the memory related disease is used as a proxy for the need of care, which seems to be difficult to misreport. The other related questions in the HRS ask whether the parent needs care, or whether the parent can be left alone for at least one hour. It seems that these questions are more subjective that the one chosen for the analysis: if a respondent is providing a significant number of hours of care, (s)he is much more likely to report that the parent needs care and/or cannot be left alone for at least one hour. Similarly, the one who does not want to provide care seem to be more likely to respond that the parent does not need care and can be left alone for a long period of time.[11]

Sample Description

The sample is limited to working, not self-employed, age-eligible[12] individuals who have at least one parent or parent-in-law alive in 1998.[13] Individuals retired in 1998 are excluded from the study. The resulting sample consists of 1434 males and 1356 females who have complete data on all of the variables of interest. See Appendix Table A1 for the sample construction details.

Table 2 presents a description of the sample. All financial variables are in 2002 dollars and non-labor income is in thousands of dollars. As can be seen from Panel A, the mean annual working hours for male workers is on average 400 hours higher than for females (2290 hours vs. 1897 hours). Unconditional (on caregiving status) caregiving hours average at 44 hours per year for males and 91 hours per year for females (2% and 5% of the average annual working time respectively). The difference widens to about 100 hours between males and females when conditioning on actual caregiving status (163 vs. 250 hours). Consideration by the type of caregiving suggests that the difference between men and women involved in caregiving is greater in time devoted to help with personal needs than in time devoted to help with chores, transportation, errands, etc.[14] Net money transfer is negative indicating that on average money flows into the care givers' households from their parents. Descriptive statistics for the explanatory

variables is presented in Panel B of Table 2.

5 Empirical Results and Discussion

Wage Elasticity Estimates

Table 3 shows the estimates of the wage impact on labor supply, informal care, and monetary transfers from both OLS/Tobit and instrumental variable regressions.[15] As could be seen the effect of wages on the informal care supply is negative and it is increasing in magnitude after instrumenting.[16] The magnitude of the wage effect on informal care supply is smaller for men than it is for women, and it is not statistically significant for men. The wage effect on labor supply is positive in every case both for males and females and increases in magnitude considerably after instrumenting.

The analysis of the net monetary transfers between adult children and elderly parents does not provide evidence for the substitution between time and monetary transfers as wages get higher. One of the potential explanations may be the possibility that the measure of the net monetary transfer over a certain short period of time does not allow for that substitution effect to take place. For example, what if the decrease in the informal care provided today is balanced with the decrease in the end-of-life transfer from parents? Indeed, Brown (2006) finds that parents on average bequeath more to children who are currently providing informal care or who are expected to become care givers in the future. It is not possible to compare the obtained estimates to those in the previous literature because of the differences in the way transfers are measured. As mentioned before, past studies analyzed gross measure of monetary transfers - either money given by parents to adult children or received by parents from adult children. Since the interest in the current analysis has been in the overall compensation for decreased informal care in response to higher wages, the net monetary transfer has been chosen as the most appropriate resulting measure. However, the magnitude and the sign of the estimated wage elasticities of net monetary transfers as well as the peculiarities of the distribution of net monetary transfers do call for further

investigation on the more appropriate empirical approach to their analysis.

The last panel of Table 3 provides first-stage statistics common to all regressions while the p-values from the Hansen overidentification tests are reported for each outcome measure separately. As could be seen, the latter test produces very high p-values, confirming the validity of the used instruments. Likewise, the hypothesis of underidentification is rejected at less than 1 percent level of significance. However, the comparison of the first stage F-statistics with the critical values reported in Stock and Yogo (2004) points to the problem of weak instruments even if 30 percent relative bias in the same direction as the OLS/ Tobit bias is accepted. Stock and Yogo (2004) do not report critical values for higher than 30 percent relative bias, but it could be extrapolated from Table 1 in their work (p.39) that for the 50 percent relative bias the first stage F-statistics would be sufficient to pass the weak instruments test. This means that the set of the instruments used in the analysis is quite weak resolving only 50 percent of the omitted variable bias. Alternatively, this means that the value of the estimate of the wage elasticity of informal care supply is far from the true one, and can only be treated as an upper bound of a more negative elasticity.

The estimates of the wage elasticities evaluated at the sample means are provided in Table 4. The estimates from the OLS and Tobit regressions show negative but close to zero wage elasticities of informal care supply. Compared to them, IV procedure produces much larger estimates: -1.8 for males and -3.6 for females. The wage elasticity of labor supply is also considerably larger in magnitude after instrumenting.

It is instructive to think about the magnitudes of the estimated elasticities: a 10% increase in wages (2.1 for men and 1.5 for women in 2002 dollars) would lead to an average decrease by 18% for men and 36% for women in unconditional hours of care provided. That would translate into 8 fewer hours of care provided by men and 33 fewer hours of care provided by women per year. The same increase in wages, with the labor supply elasticity of 0.19 (men) and 0.31 (women)[17], implies 44 hours more work per annum for men and 59 for women. This comparison suggests that the wage elasticity of care supply is far from being trivial. On the contrary, in absolute terms

it makes up about 18% of the labor supply response for men and about 56% of the labor supply response for women.

Since the focus of this study is on the informal care that adult children provide to their elderly parents, the rest of this section will consider some important extensions in turns: impact of the availability of substitutes and parents' living arrangements. Panel BV of Table 4 presents the relevant estimates.

Availability of Substitutes

While the analysis above focuses on the total time devoted to parents, the detailed information in the data also allows studying the wage effects on the care supply disaggregated by the type of activities. It is reasonable to expect the help with household chores to be more elastic: it may be less burdensome and not as urgent as personal care. Hence, it is easier to postpone the task or to find a substitute. For example, the frequency of household chores or money management can be easier to reduce in the face of increasing wage rates compared to the tasks of bathing, dressing, and feeding the elderly parents.

Rows (1)-(2) in Panel B of Table 4 provide information for the comparison of the wage elasticities of informal care supply by different types of caregiving activities not conditioning on the actual caregiving status. As can be seen, the estimated wage elasticity of help with household chores is generally larger in magnitude and statistically more significant than that of the help with basic personal needs, and the difference is greater for females.

Row (3) shows that individuals with siblings (the majority of the sample) are more responsive to changes in the wage rates, with the estimates of the wage elasticities being considerably larger than in the benchmark case in row (3) of Panel A.[18]

To summarize, these findings suggest that the wage elasticity of informal care supply depends on the availability and ease of substitution. The easier it is to find a substitute for a certain caregiving task (either because the task itself is not unpleasant, or because a care giver has more siblings to rely on) the larger in absolute value the wage elasticity is.

Parents' Living Arrangements

Current analysis does not account for the differences in living arrangements of elderly parents. It includes respondents with parents living independently, with the respondent or other relatives, or in nursing home. At the same time this potentially may have considerable impact on the results. On the one hand, the amount of care provided may depend on how far the parent lives from the child, suggesting living arrangement as another control in the model. On the other hand, parents' living arrangements can be considered as part of the informal care supply decisions: when the need for more care arises, parents may relocate closer to the child, or start coresiding together. Earlier literature tried to circumvent this problem by excluding pairs with coresident parents and parents in nursing homes. Last three rows in Panel B, Table 4, show the results for the samples of individuals excluding individuals with at least one parent (i) coresiding with them, (ii) in nursing home, (iii) either coresiding or in nursing home. Although, the estimated elasticities change slightly, and in some cases the estimated effects become statistically insignificant, they are still quite close to the ones obtained from the basic analysis. Thus, the estimates obtained earlier are fairly robust to the differences in the living arrangements of elderly parents.

6 Conclusion

This paper extends the existing literature on informal caregiving by addressing the issue of omitted variable bias in the estimates of the wage elasticity of informal care supply. Existence of this bias would suggest that the previous estimates may be too small. Using the state level unemployment rate and industry structure and their interactions with education as instruments for wages, this study finds that the elasticity of informal care supply with respect to wages is negative and large in magnitude. Although the problem of weak instruments suggests a significant remaining bias, the estimates of the wage elasticity of informal care supply can be treated as upper bounds, drawing attention to the presence of considerable in magnitude negative impact of wages on informal care for elderly.

As in the case of labor supply, the supply of informal care by females tends to be more elastic than that by males. Furthermore, informal care supply is more elastic for individuals who have siblings and independently living parents, and is more elastic when considering time spent helping parents with household chores, errands, transportation, etc., suggesting that the availability of the substitutes and the ease of substitution matters a lot for the magnitude of the informal care supply response to wages. However, the analysis does not support the hypothesis of substitution from time towards monetary transfers to elderly parents as wages get higher.

To conclude, this paper shows that the fiscal incentives which would effectively increase wages of near elderly could bring more hours of labor supplied. However, this increase may be accompanied by a decrease in the number of hours of informal care provided to the elderly. The question remains of whether the benefits from increased labor supply (and corresponding earnings increase) would outweigh the costs associated with lower levels of informal care. And the answer depends on many other estimates - average tax rates, prices of formal care, likelihood that the elderly would seek government support to cover the formal care costs, and the consequences to those who would decide not to seek any care, as well as the parents' altruistic welfare gain from improved well-being of adult children - which definitely require further investigation.

References

Apfel, Kenneth. 2004. US Aging Policy at a Crossroads: Major Choices Ahead. *Paper Prepared for The International Symposium on the Challenges of the New Societies: Implications for Current Social Policies; Valencia, Spain.*

Accessed November 2004. Available at http://www.utexas.edu/lbj/faculty/apfel/valencia.pdf.

Bacolod, Marigee. 2007. Do Alternative Opportunities Matter? The Role of Female Labor Markets in the Decline of Teacher Quality, 1960-1990. *Review of Economics and Statistics* 89(4): 737-51.

Baker, Michael and Dwayne Benjamin. 1999. How Do Retirement Tests Affect the Labour Supply of Older Men? *Journal of Public Economics* 71(1): 27-52.

Bhattacharya, Debopam. 2004. Seemingly Unrelated Regressions with Identical Regressors: A Note. *Economics Letters* 85(2): 247-55.

Blackburn, McKinley L. 1990. What Can Explain the Increase in Earnings Inequality Among Males? *Industrial Relations* 29(3):44156.

Blau, Francine D. and Lawrence M. Kahn. 2007. Changes in the Labor Supply Behavior of Married Women: 1980-2000. *Journal of Labor Economics* 25:393-438.

Blundell, Richard and MaCurdy, Thomas. 1999. Labor Supply: A Review of Alternative Approaches. In *Handbook of Labor Economics Volume 3*, edited by O. Ashenfelter and D.Card. Elsevier-North Holland, pp. 1559-1695.

Bolin, K., B. Lindgren, and P. Lundborg. 2007. Informal and Formal Care Among Single-Living Elderly In Europe. *Health Economics* 17(3):393-409.

Borjas, George and Valerie Ramey. 1995. Foreign Competition, Market Power, and Wage Inequality. *Quarterly Journal of Economics* v110, n4:1075-110.

Brown, Meta. 2006. Informal Care and the Division of End-of-Life Transfers. *Journal of Human Resources* 41(1):191-219.

Bureau of Labor Statistics.2006-2007. Occupational Outlook Handbook.

Accessed February 2006. Available at http://www.bls.gov/oco.

Burtless, Gary and Robert A. Moffitt. 1984. The Effect of Social Security Benefits on the Labor Supply of the Aged. In *Retirement and Economic Behavior*, edited by H. Aaron and G. Burtless. Washington: The Brookings Institution.

CBO (Congressional Budget Office). 2004. Retirement Age and the Need for Saving. May, 12. Accessed November 2004. Available at http://www.cbo.gov/showdoc.cfm?index=5419&sequence=0.

Carlin, Paul S. 2001. Evidence of the Volunteer Labor Supply of Married Women. *Southern Economic Journal* 67(4):801-24.

Coile, Courtney C. 2004. Health Shocks and Couples' Labor Supply Decisions. NBER Working Paper No. 10810.

Couch, Kenneth, Mary Daly, and Douglas Wolf. 1999. Time? Money? Both? The Allocation of Resources to Older Parents. *Demography* 36(3):219-32.

Dentinger, Emma and Martin E. Clarkberg. 2002. Informal Caregiving and Retirement Timing Among Men and Women: Gender and Caregiving Relationships in Late Midlife. *Journal of Family Issues* 23(7):857-79.

Ettner, Susan L. 1995. The Impact of Parent Care on Female Labor Supply Decisions. *Demography* 32(1):63-80.

Ettner, Susan L. 1996. The Opportunity Costs of Elder Care. *The Journal of Human Resources* 31(1):189-205.

Friedberg, Leora. 2000. The Labor Supply Effects of the Social Security Earnings Test. *The Review of Economics and Statistics* 82(1):46-63.

Greene, W. 2000. *Econometric Analysis*. 4th edition. Upper Saddle River, New Jersey: Prentice-Hall, Inc.

Gruber, Jonathan and Peter Orszag. 1999. What to do About the Social Security Earnings Test. *Center for Retirement Research, Boston College.*

Haider, Steven J. and David Loughran. 2008. The Effect of the Social Security Earnings Test on Male Labor Supply: New Evidence from Survey and Administrative Data. *Journal of Human*

Resources 43(1):57-87.

Health and Retirement Study, (HRS 1998 Core) public use dataset. Produced and distributed by the University of Michigan with funding from the National Institute on Aging (grant number NIA U01AG009740). Ann Arbor, MI, (1998).

Heim, Bradley T. 2007. The Incredible Shrinking Elasticities: Married Female Labor Supply, 1978-2002. *Journal of Human Resources* 42(4):881-918.

Ioannides, Yannis and Kambon Kan. 1999. The Nature of Two-Directional Intergenerational Transfers of Money and Time: An Empirical Analysis. In *Economics of Reciprocity, Giving and Altruism 18*, edited by Jean Mercier Ythier, Serge-Christophe Kolm and Louis-Andre Gerard-Varet. London: Palgrave Macmillan, pp.314-335.

Johnson, Richard W. and Melissa Favreault. 2001. Retiring Together or Working Alone: The Impact of Spousal Employment and Disability on Retirement Decisions. *Center for Retirement Research* Working Paper No. 2001-01.

Kazi, Paula. 2006. Timing of Retirement and Family Obligations *Ph.D. diss.* Michigan State University.

Killingsworth, Mark and James Heckman. 1986. Female Labor Supply: A Survey. In *Handbook of Labor Economics Volume 1*, edited O. Ashenfelter and R. Layard. Elsevier-North Holland, pp.103-204.

Kimmel, Jean and Thomas J. Kniesner. 1998. New Evidence on Labor Supply: Employment versus Hours Elasticities by Sex and Marital Status. *Journal of Monetary Economics* Volume 42(2):289-301.

McGarry, Kathleen. 2003. Does Caregiving Affect Work? Evidence based on Prior Labor Force Experience. In *Health Care Issues in the United States and Japan*, edited by David A. Wise. Chicago: University of Chicago Press.

Mroz, Thomas. 1987. The Sensitivity of an Empirical Model of Married Women's Hours of Work to Economic and Statistical Assumptions. *Econometrica* 55(4):765-99.

Mulligan, Casey. 1995. The Intertemporal Substitution of Work - What Does the Evidence Say?

University of University of Chicago - Population Research Center No. 95-11.

Norton, Edward C. and Courtney Harold Van Houtven. 2006. Inter-vivos Transfers and Exchange. *Southern Economic Journal* 73(1):157-72.

Pavalko, Eliza K. and Kathryn A. Henderson. 2006. Combining Care Work and Paid Work: Do Workplace Policies Make a Difference? *Research on Aging* 28(3):359-74.

Pencavel, John. 1986. Labor Supply of Men: A Survey. In *Handbook of Labor Economics Volume 1*, edited by O. Ashenfelter and R. Layard. Elsevier-North Holland, pp.3-102.

Pencavel, John. 1998. The Market Work Behavior and Wages of Women: 1975-94. *Journal of Human Resources* v33, n4:771-804.

Pencavel, John. 2002. A Cohort Analysis of the Association between Work Hours and Wages among Men. *Journal of Human Resources* 37(2):251-74.

Pienta, Amy M. 2003. Partners in Marriage: An Analysis of Husbands' and Wives' Retirement Behavior. *Journal of Applied Gerontology* 22(3):340-58.

Schokkaert, Erik. 2006. The Empirical Analysis of Transfer Motives. In *Handbook of the Economics of Giving, Altruism and Reciprocity Volume 1*, edited by S.-Ch. Kolm and J.M. Ythier. Elsevier-North Holland, pp.127-181.

Schwabish, Jonathan. 2002. Male and Female Wage Elasticities: An exploration of convergence. *Unpublished manuscript.*

Accessed October 2004. Available at http://www-cpr.maxwell.syr.edu/seminar/fall02/Schwabish_converge.pdf.

Senesky, Sarah. 2003. Testing the Intertemporal Labor Supply Model: Are Jobs Important? *Labor Economics* 12(6):749-72.

Sloan Frank A., Gabriel Picone, and Thomas J. Hoerger. 1997. The Supply of Children's Time to Disabled Elderly Parents. *Economic Inquiry* 35:295-308.

Sloan, Frank, Harold Zhang, and Jingshu Wang. 2002. Upstream Intergenerational Transfers. *Southern Economic Journal* 69(2):363-80.

Stock, James H. and Motohiro Yogo. 2005. Testing for Weak Instruments in Linear IV

Regression. In *Identification and Inference for Econometric Models 6* edited by W.K. Andrews. New York: Cambridge University Press,pp.80-108.

Schmidt, Lucie and Purvi Sevak. 2009. Taxes, Wages, and the Labor Supply of Older Americans. *Research on Aging* 31(2):207-32.

Van Houtven, Courtney and Edward C. Norton. 2004. Informal Care and Health Care Use of Older Adults. *Journal of Health Economics* 23(6):1159-80.

Viitanen, Tarja K.. 2007. Informal and Formal Care in Europe. *IZA Discussion Paper* No. 2648.

U.S.DHHS (U.S. Department of Health and Human Services). 1997. Active Aging: A Shift in the Paradigm. May.

Accessed November 2004. Available at http://aspe.hhs.gov/daltcp/reports/actaging.htm on 11/8/2004.

Zissimopoulos, Julie. 2001. Resource Transfers to the Elderly: Do Adult Children Substitute Financial Transfers for Time Transfers? RAND Working Paper 01-05.

Notes

[1]Initial access to the restricted data has been provided through the project under the supervision of David Neumark and Elizabeth Powers.

[2]Monetary transfers incorporate flows of money in both directions but time transfer in the model flows only from the care giver to the care recipient for two reasons. First of all, the model is developed to describe the relationship between a care giver and a care recipient. The latter, being in need of care from other people, is unable of producing that care for him/herself, and therefore unable to provide any care for others. Secondly, in the HRS 1998 sample the prevalence and magnitude of time flow from elderly parents to adult children is quite low - it is virtually zero after the age 80. On the contrary, as the description of the data will show later, financial transfers are likely to flow in both directions, no matter how old the involved parties are.

[3]Another alternative would be to use the two-part Cragg's model (Sloan et al. 2002). But the size of the sample of actual caregivers in that case would be too small for the use of the instrumental variable methods.

[4]Even though the distribution of net monetary transfers has most of its mass on zero, the OLS still provides best linear prediction and allows for consistent estimates of parameters around mean.

[5]Trade-impacted concentrated industries include: Stone, Clay and Glass Products; Primary Metal Industries; Industrial Machinery and Equipment; Motor Vehicles and Equipment; Other Transportation Equipment. Trade-impacted competitive industries include Apparel and Other Textile Product Industries. Other durables industries include the rest of the manufacturing sector: Lumber and Wood Products; Furniture and Fixtures; Fabricated Metal Products; Electronic and Other Electric Equipment; Instruments and Related Products; Miscellaneous Manufacturing; and Ordinance.

[6]Inclusion of the variable reflecting price of formal care at the state level, such as average wages of the personnel, does not change the estimates of the wage elasticity considerably while having virtually no explanatory power on their own. This may suggest that these measures are poor proxies for the variation in the prices at the individual level. Description of this exercise and the full set of estimates are available upon request.

[7]The HRS is sponsored by the National Institute of Aging (grant number NIA U01AG 009740) and is conducted by the University of Michigan.

[8]Workers include those who report positive working hours and do not report full retirement in 1998.

[9]50% of males and 56% of females report being paid hourly.

[10]Standardized annual working hours are calculated as weeks worked last year multiplied by 40 if the individual reported usual weekly hours being greater than 25 and by 20 if the reported usual weekly hours are less than or equal to 25 (Kimmel and Kniesner 1998).

[11]The sensitivity analysis including all of the indicators of the parental care needs available in the HRS shows little effect on the wage elasticity estimates, while the coefficients on the parental care needs indicators become not statistically significant, reflecting their high levels of correlation.

[12]Age-eligible means those individuals who are aged 50 and over. Since some people had spouses younger than that age, the HRS interviewed them as well, but including them would not be desirable for the current study.

[13]Although the HRS has a great potential in studying the dynamics of many interesting processes, the question in this study cannot benefit from this richness mainly because of the time frame to which the question on informal care refers. Individuals are asked about their caregiving over the past 2 years. Over that long period of time, they are likely to go through several statuses - from potential caregivers to moderate contributors to elderly care to intensive caregiving to the

extreme of loosing parents or their recovering. At the same time over that 2 year time window, the wage rate is unlikely to change much, likewise the instrument set suggested in the paper. Similarly, the variables which describe the parental status are measured every two years. Therefore, the caregiving decisions would be subject to change due to mostly unobserved health characteristics of the parents over these two years. And thus, the model which would try to explain changes in the supply of care with the changes in the explanatory variables will be very noisy. This has been confirmed by virtual absence of explanatory power of the fixed effect model at the earlier stages of current research.

[14]This fact may simply reflect the higher life expectancy for women and preferences for the same-sex helper with the basic needs.

[15]With regard to the instrumental variable estimation, almost all estimated parameters, except for the wage effects, are relatively consistent across specifications in terms of statistical significance and sign. Full sets of estimates associated with the numerous covariates are available from the author upon request.

[16]Results from the 1st stage regression are presented in Appendix Table A5.

[17]Unfortunately no instrumental variable estimates of the wage elasticity of labor supply for older workers is known to the author. However, the wage elasticity from the OLS regression is almost identical to that reported for older workers by Schmidt and Sevak (2006). At the same time the IV estimates fall within the range of the wage elasticity for all workers: for women from 0.13 (Mroz 1987) to 0.59 (Blau and Kahn 2007) and for men from 0.05 to 0.22 (Pencavel 2002).

[18]Given the findings in the previous literature that daughters are more likely to provide care it would be more logical to investigate the sample excluding individuals without any sibling and those with only brothers. However, this would have made the sample too small to implement reasonable instrumental variable analysis: the sample of individuals without either sisters or sisters-in-law is 428 for males and 314 for females.

Table 1: Estimates of the Wage Elasticities of Care Supply from Previous Research

Couch et al. (1999), 1988 PSID				
Caregivers, Tobit				
	Married couples	Single		
male	-0.22*	-0.69+		
female	-0.16	-0.58**		
Zissimopoulos (2001), 1994 HRS				
Care Recipients, Tobit				
		Has sibling	No sibling	Spouse wage
from any child	-0.05*			
from male child		0.07	-0.07	0.07
from female child		-0.05	0.16	-0.02
Sloan et al. (2002), 1992 HRS				
Caregivers, hurdle in logs				
	Probit coefficient	OLS coefficient		
Care	0.18 (0.14)	-0.11 (0.13)		
Chores	-0.10 (0.09)	0.05 (0.06)		
Ioannides and Kann (1999), 1988 PSID				
Caregiving Households, Tobit				
Husband wage	-0.02*			
Wife wage	-0.02+			
Sloan et al. (1997), 1989 NLTCS of Informal Caregivers				
Care Recipients, linear OLS corrected for selectivity				
	Mean Wage	Wage Elasticity		
	5	-0.26		
	10	-0.52		
	15	-0.78		

Note:

1. Standard errors of the wage elasticities have not been presented in the reviewed studies and so signs near the estimates indicate the statistical significance of the wage effects, not the significance of the wage elasticities.

2. ** - significant at 1% level, * - significant at 5%, + - significant at 10%.

Table 2: Descriptive Statistics

	Males		Females	
Sample Size	1434		1356	
A. Dependent Variables				
Annual working hours	2290.15	(660.29)	1897.29	(653.51)
Annual care hours, unconditional	44.04	(162.20)	91.13	(312.69)
Annual care hours, conditional	163.18	(279.61)	250.00	(478.32)
Prevalence of caregiving	0.27		0.36	
Annual personal care hours, uncond	16.81	(105.78)	40.31	(235.42)
Annual personal care hours, cond	213.27	(317.65)	325.87	(597.28)
Annual chores hours, uncond	27.23	(91.35)	50.81	(160.23)
Annual chores care hours, cond	110.94	(157.33)	156.12	(250.05)
Net annual money transfer	-190.79	(2489.68)	-110.55	(2333.33)
B. Explanatory Variables				
Hourly Wage	20.77	(12.55)	14.59	(8.73)
Non-labor Income (capital income)	12.41	(227.12)	6.55	(17.11)
Total Wealth	237.76	(402.96)	254.07	(703.86)
Age	57.11	(4.40)	56.21	(4.17)
Education	13.10	(3.07)	13.08	(2.52)
If non-white	0.14		0.18	
If hispanic	0.09		0.06	
If married	0.88		0.72	
If in poor health				
Number of children $<$ 6 years old	0.04	(0.25)	0.04	(0.23)
Number of children 6-18 years old	0.30	(0.70)	0.18	(0.53)
Number of own sisters	0.28	(0.89)	0.29	(0.93)
Number of own brothers	0.24	(0.83)	0.27	(0.79)
Number of sisters-in-law	0.40	(1.09)	0.23	(0.82)
Number of brothers-in-law	0.36	(0.98)	0.20	(0.75)
Number of parents	1.64	(0.80)	1.50	(0.70)
Share of mothers	0.74	(0.34)	0.74	(0.35)
Oldest parent's age	82.05	(6.48)	83.08	(6.12)
If at least one parent is				
single	0.97		0.96	
with memory disease	0.17		0.17	
homeowner	0.73		0.71	
poorer	0.48		0.43	
richer	0.37		0.38	

Note: Numbers in the table are sample averages and numbers in parentheses are standard deviations.

Table 3: Wage Effect Estimates

	Males		Females	
	Tobit/OLS	IV-Tobit/2SLS	Tobit/OLS	IV-Tobit/2SLS
	(1)	(2)	(3)	(4)
Observations	1434	1434	1356	1356
Annual Care Hours				
	-26.71	**-310.92**	**-55.88**	**-920.66***
	(26.64)	**(194.74)**	**(44.72)**	**(426.85)**
Uncensored obs	387	387	495	495
Chi-Square	76.23**	66.13**	94.78**	70.99**
Observed P($y > 0$)	0.2699		0.3950	
Pred. P($y > 0|x$)	0.2619		0.3549	
Annual Working Hours				
	39.72	**432.90+**	**275.27****	**587.40+**
	(44.67)	**(243.00)**	**(45.60)**	**(336.17)**
R-square/F-stat	0.11	9.19	0.13	4.03
Hansen J-test		p-val=0.7311		p-val=0.4037
Net Money Transfer				
	57.20	**571.62**	**175.86**	**-2,288.26+**
	(117.82)	**(845.36)**	**(145.25)**	**(1270.68)**
R-Square/F-stat	0.05	2.28	0.04	1.61
Hansen J-test		p-val=0.5423		p-val=0.2876
Common First-stage Statistics				
30% rel.bias critical value		4.80		4.80
First stage F-stat		3.10		2.19
First stage partial R sq		0.0219		0.0133
Ho: underidentification		p-val=0.0016		p-val=0.0094

Notes:

1. Standard errors in parenthesis.
2. ** - significant at 1% level, * - significant at 5%, + - significant at 10%.
3. Every estimate is from the regression with the full set of individual and parental controls described in the methodology.
4. Full sets of estimates associated with numerous covariates are available from the author upon request.

Table 4: Estimates of the Wage Elasticities

	Males			Females		
	N	Tobit	IV-Tobit	N	Tobit	IV-Tobit
A. Main Analysis						
Labor Supply	1434	0.0173	0.1890+	1434	0.1451**	0.3093+
Monetary Transfer	1434	0.2998	2.9961	1434	1.5908	-19.8506+
Total Care Supply	1434	-0.1588	-1.8490	1356	-0.2176	-3.5855*
B. Analysis of Heterogeneity: Informal Care Supply						
Help with Basic Needs	1434	-0.2095	-1.5340	1356	-0.2341	-2.0686
Other Caregiving	1434	-0.0502	-2.1639*	1356	-0.1160	-3.4429*
Excluding Those W/O Siblings	1331	-0.1565	-2.4766+	1242	-0.2793	-4.9724*
No parents coresidents	1372	-0.0455	-1.3248	1271	-0.2122	-4.0012*
No parents in nursing home	1250	-0.2003	-2.2922+	1168	-0.1580	-3.2185*
No parents coresidents/ in nursing home	1191	-0.0794	-1.6730	1086	-0.1518	-3.6737*

Notes:

1. Signs near the estimates indicate the statistical significance of the wage effects.
2. See also Notes to Table 4.

APPENDIX

Table A1. Sample Selection Criteria

	Males		Females	
Initial Sample Interviewed in 1998	9669		13212	
If non-missing state of residence	8704	90.02%	12139	91.88%
If Age Eligible	6566	67.91%	8151	61.69%
Potential Caregivers	3305	34.18%	3318	25.11%
If not retired in 1998	2425	25.08%	2748	20.80%
If working and 0<wage reported<100	1817	18.79%	1617	12.24%
If 0<annual working hours<5200	1773	18.34%	1568	11.87%
If non-missing respondent's characteristics	1769	18.30%	1554	11.76%
If parents' info is non-missing	1765	18.25%	1546	11.70%
If non-self employed	1434	14.83%	1356	10.26%

Table A2. Estimation Results: First-Stage Wage Regression

Log hourly wage	Males (1)	Females (2)
Individual characteristics		
Unemployment rate	-0.050**	-0.020
	(0.019)	(0.021)
Share of employment in trade-impacted concentrated industries	-0.189*	0.073
	(0.082)	(0.087)
Share of employment in trade-impacted competitive industries	-0.076	-0.223
	(0.213)	(0.239)
Share in trade-impacted durable goods industries	0.188*	-0.082
	(0.079)	(0.085)
Share of employment in services industries	-0.004*	-0.017
	(0.023)	(0.025)
Share of employment in government jobs	-0.008*	-0.067+
	(0.035)	(0.040)
Interaction terms		
Education in trade-impacted concentrated industries	0.015**	-0.004
	(0.006)	(0.006)
Education in trade-impacted competitive industries	0.014	0.016
	(0.015)	(0.017)
Education in trade-impacted durable goods industries	-0.016**	0.006
	(0.006)	(0.006)
Education of employment in services industries	0.001	0.002
	(0.002)	(0.002)
Education in government jobs	0.002	0.005*
	(0.002)	(0.003)
Observations	1434	1356
R-square	0.37	0.34
Partial R-squared	0.0219	0.0133
F-stat of excluded IVs	3.10	2.19

Note: Other controls include all of the variables used in the main regressions: individual characteristics, parental characteristics, and region dummies.