minist Economics 16(3), July 2010, 169–192

PARENTAL CARE AND MARRIED WOMEN'S LABOR SUPPLY IN URBAN CHINA

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ABSTRACT

The aging of the population and the dramatic increase in women's labor force participation have made eldercare and women's labor market outcomes a subject of considerable policy importance not just in industrialized countries but also in transition and developing countries. This study examines the impact of parental care on married women's labor supply in urban China using the *China Health and Nutrition Survey* for the period 1993–2006. The estimates show that Chinese women confront competing demands for care, not only among elderly parents but also between older parents and their own young children. Moreover, the estimates unveil striking differences in labor market outcomes between caring for parents and caring for parents-in-law: caring for parents does not affect the caregiver's employment status and work hours, whereas caring for parents-in-law has a statistically significant, sizable, negative effect on the caregiver's probability of employment and hours of paid work.

KEYWORDS

Eldercare, women's labor supply, patrilineal norms, China

JEL Codes: J14, J16, J22

INTRODUCTION

The aging of the population and women's massive entry into the labor force in recent decades have made eldercare and women's labor market outcomes a subject of considerable policy importance not just in industrialized countries but in transition and developing countries as well.[1] While much research has been devoted to the potential conflicts women face between paid work and care responsibilities in industrialized countries, our knowledge about the situation in transition and developing countries remains limited. To fill in this knowledge gap, this study examines the impact of parental care on married women's labor supply in urban China with a nationally representative dataset for the period 1993–2006.[2] The study is the first empirical analysis of its kind for a developing country.

Feminist Economics ISSN 1354-5701 print/ISSN 1466-4372 online
http://www.tandf.co.uk/journals
DOI: 10.1080/13545701.2010.493717

Over the past three decades, China has undergone a transition from a centrally planned economy to a market one. The economic transition has brought about rapid income growth and has consequently benefited Chinese women and their families. However, the transition has also intensified the strain on Chinese women via the dual demands of paid work and provision of care to family members. The fundamental restructuring of the public sector has not only made paid work ever more demanding, it has also led to a substantial cutback in government and employer support for childcare and eldercare. The demographic transition associated with the economic transition and income growth has further exacerbated the tension between paid work and care provision for Chinese women. While China's one-child policy means that there are fewer children to be cared for, steep declines in fertility, combined with longer life expectancy, have dramatically increased the proportion of aged dependents and intensified the need for caring services. According to official statistics, the proportion of the Chinese population aged 65 years and above rose from 4.9 percent in 1982 to 8.3 percent in 2008 (National Bureau of Statistics of China 2009: 90). Analysts project that China's aged dependency ratio will surpass that of industrialized countries in 2020 and become the highest of any population in the world by the mid twenty-first century.[3] As the elderly population has grown, the number of seniors who have chronic diseases, such as cerebrovascular disease, arthropathy, and dementia, has also increased.[4] The increased population of disabled senior citizens has substantially raised the demand for eldercare. Given the socioeconomic and demographic trends in China, the present analysis provides valuable new insights into the conflicts women face between unpaid care and paid work for other regions undergoing similar changes.[5]

In the literature on industrialized countries, the effects of eldercare on women's labor supply have been analyzed from two perspectives. Mainstream labor economics stresses the role of economic incentives. It argues that increases in the responsibility of caring for frail parents have price and income effects that influence caregivers' labor market participation decisions in contradictory ways (Fiona Carmichael and Sue Charles 1998). On the one hand, a rise in the need to take care of parents will increase the reservation wage of a caregiver and consequently reduce the labor supply through a substitution effect. On the other hand, the care needs of parents may increase the labor supply through an income effect, given that caregiving and care needs impose further costs on caregivers. Hence, the net effect of eldercare on women's labor supply is ambiguous.

Empirical studies that employ a mainstream labor economics perspective and focus on industrialized countries in the West show that informal caregiving for the elderly has either no effect or a negative effect on women's labor supply. Of the selected studies on the United States, Robyn

I. Stone and Pamela F. Short (1990) find that informal care has a strong negative effect on women's employment. In contrast, Rachel F. Boaz and Charlotte F. Mueller (1992) find that in the US, unpaid care services have no effect on women's working hours for part-time work but have a small negative effect for full-time work. Douglas A. Wolf and Beth J. Soldo (1994) find a negative but insignificant effect of informal care on work hours for women in the US. The findings of Susan L. Ettner (1995) and Jane Kolodinsky and Lee Shirey (2000) show that co-residence with a disabled parent significantly reduces work hours for women in the US. Susan L. Ettner (1996) finds that in the US, providing nonresidential care to an elderly parent has a statistically significant negative effect on women's labor hour supply but has no effect on men's work hours. Carmichael and Charles (1998) and Ehsan Latif (2006) are among a small body of studies based on data from other developed countries. Using data from the United Kingdom General Household Survey, Carmichael and Charles (1998) present evidence that in the UK informal care reduces women's labor force participation only when it requires a substantial time commitment. Latif's (2006) analysis of data from the Canadian General Social Survey concludes that informal care has no impact on labor force participation there, but does have a significant negative effect in terms of increased total hours worked (paid and unpaid) for women in Canada.

In contrast to mainstream economists, feminist economists emphasize institutional factors that affect the interplay of eldercare and women's labor market outcomes (Nancy R. Hooyman and Judith G. Gonyea 1999; Lourdes Benería 2003; Shahra Razavi 2007). Feminist economists contend that the gender patterns of labor division between unpaid care and paid work are socially constructed, because cultural norms and public policy play a key role in assigning responsibilities and shaping outcomes. They point out that care is crucial to human well-being, and through its contribution to human and social capital investment, care plays a pivotal role in generating and sustaining economic growth (Nancy Folbre and Julie Nelson 2000). However, in many societies in which care provision is commonly viewed as a natural aspect of women's role and labor markets and social welfare and security are formulated, for the most part, to conform to the male-breadwinner norm, women's contributions to care seldom receive proper recognition, and their needs for support are often overlooked in the design of social policy (Diane Elson 1991; Maria Sagrario Floro 1995).

In such institutional settings, caring for frail elders has negative repercussions for women's well-being, regardless of how care for family members may affect women's labor market participation – whether it has a negative effect or no effect on their labor supply. For instance, women who have to adjust their employment to meet the demands of eldercare lose income and employment-related benefits such as health insurance and pension plans as a result of the foregone employment opportunity or

reduced labor supply (Janet E. Fast, Deanna L. William, and Norah C. Keating 1999). The loss of income and entitlements to health insurance and pension benefits force women to rely on spouses and adult children for support in daily living and old age. Women who make no reduction in their hours of paid work to compensate for the demands of their eldercare responsibilities may fare no better, given that the need to balance the simultaneous demand of jobs, household, and eldercare can create emotional and physical strains and reduce the amount of time available for social networking, personal development, and political participation (Paula B. Doress-Worters 1994; Fast, William, and Keating 1999). Thus, how a society addresses the problems of care has important implications for the achievement of gender equality.

In the current study, which aims to fill in important gaps in the literature on care provision in developing countries, we apply the two perspectives discussed above to analyze the impact of parental care on married women's labor supply in urban China and guide the interpretation of the results. Taking into account the influence of Chinese traditional cultural norms on women's marriage and care responsibilities, which impose greater obligations on women for taking care of parents-in-law, we explore the differences in labor market outcomes between caring for parents and caring for parents-in-law. We find that caring for parents does not affect the caregiver's employment status and paid work hours, whereas caring for parents-in-law has a statistically significant, sizable negative effect on the caregiver's probability of employment and hours of paid work. This result is consistent with the view of feminist scholars that social and cultural norms are important determinants of women's time allocation between paid work and unpaid care labor.

Moreover, our findings also have important policy implications. To avoid an eldercare crisis and promote the well-being of women, children, and families, the Chinese government should reform existing labor market and eldercare policies, giving greater recognition to unpaid care work and developing services and support for caregivers.

BACKGROUND

In traditional Chinese society, care for the elderly was the sole responsibility of families (Heying Jenny Zhan and Rhonda J.V. Montgomery 2003). The institution of familial care was sustained by the Confucian ethic of filial piety, which requires that children unconditionally obey their parents and do everything possible to please them (William T. Liu 1998). The system of filial piety care was built on the social structure of a patriarchal, patrilocal, and patrilineal family system.[6] Women were expected to live with their husbands' families after marriage and take care of their parents-in-law on a daily basis. Subordinating to men and caring for children and parents-in-law were

viewed as the essential virtues of women in a Confucian society (Xiaorong Li 1995).

During Mao's socialist era (1949–76), the status of women in society improved considerably. In the cities, most women of working age entered the labor force and worked on a full-time basis in state-owned enterprises. The status of state employee entitled women as well as men to lifetime-secured employment and a wide range of social services and benefits, from maternity leave, childcare, healthcare, and subsidized housing to retirement pensions. Job security, public healthcare, death benefits, and pension entitlements provided by the employer gave working men and women a sense of economic security for old age. However, the provision of care for the elderly remained the responsibility of families. The Marriage Law of 1950 and the Constitution of 1954 stipulate that caring for the elderly is the responsibility of Chinese citizens, and it is a criminal offense for an adult child to refuse to perform her or his proper duty to support an aged family member (Michael Palmer 1995).[7] Just as other working women throughout the world, Chinese women bore the double burden of paid work and unpaid domestic labor, but the socialist labor regime minimized the labor market "penalties" that women had to endure due to their role as caregivers in a market economy. Because workers were employed for life and wage structures were centrally determined and not closely linked to job performance, women did not have to relinquish employment opportunities for caregiving responsibilities, nor did they suffer substantial wage losses due to reduced work hours or lower labor productivity as a result of their caregiving role. Social services provided by the employer, such as childcare, healthcare, and access to retirees' service centers, also helped alleviate the emotional and physical strains resulting from competing caregiving demands on women's time (Bohong Liu, Yongying Zhang, and Yani Li 2008). Thus, despite women's role as primary caregivers for children and elders, during this period, China's women's labor force participation rate was among the highest in the world, and the gender wage gap was remarkably small by international standards (Elisabeth Croll 1983). Increases in women's economic independence markedly weakened patrilineal care norms. It became more socially acceptable for women to take care of their own parents rather than their husbands', and the number of disabled elders being taken care of by sons and sons-in-law was also on a steady increase (Deborah S. Davis 1993; Rosemary S. Cooney and Juxin Di 1999).

China embarked on the transition from a centrally planned to a market economy in 1978. In post-economic reform China, family members continue to be the primary caregivers for the elderly. Studies based on nationally representative surveys indicate that about 98 percent of urban residents above 60 years invariably lived with either spouses or adult children during the period 1988–2002 (Xin Meng and Chuliang Luo 2008).

The proportion of people in this age group living with adult children was 71 percent in 1988, down to 59 percent in 1995, and up slightly to 61 percent in 2002. Consistent with these statistics of co-residence, data from the 2006 Chinese Aged Population Survey show that spouses, adult children, and relatives took care of 89 percent of the disabled elderly in the urban sector, while only 11 percent used paid caregiving services (China Research Center on Ageing 2006).[8] According to the survey, while sons' and sons-in-laws' involvement in caregiving activities was substantial, daughters and daughters-in-law accounted for the majority share of informal care work (see Table 1).[9] As our introduction points out, China's ongoing demographic transition to an increasingly aged society has greatly increased the eldercare burdens on families. Due to the effect of the one-child family policy on China's demographics, growing numbers of married couples are beginning to be responsible for four parents (Lanyan Chen and Hilary Standing 2007).

Balancing the simultaneous demands of paid work and care for family members at different stages of the life span has become a real challenge for women in the post-reform era, as the economic transition has fundamentally changed the landscape of China's urban labor market. The decentralization and privatization of state-owned enterprises have brought an end to "cradle-to-grave" socialism and lifetime employment for urban Chinese workers. Like the restructuring of welfare states in developed countries in the 1990s, the dismantling of the employer-based welfare system in China has led to a substantial decline in state and employer support for care provision, shifting care responsibilities predominantly to the family.[10] In the late 1990s, most Chinese enterprises ceased to provide childcare services for their employees. Due to the cutback in government funding for social services, many publicly subsidized care facilities were either shut down or transformed into service-for-fee commercial programs. Moreover, under pressure for profits, enterprises were increasingly reluctant to accommodate employees' caregiving needs. As a consequence,

Table 1 Patterns of care for the disabled elderly by family members

Caregivers	*Proportion (%)*	*Average no. caregivers*	*Average no. days of caregiving per person in past 6 months*
Spouse	55.31	–	95.87
Sons	40.35	1.45	77.85
Daughters-in-law	37.73	1.43	66.01
Daughters	57.37	1.73	62.56
Sons-in-law	26.64	1.67	71.86

Notes: The statistics presented in this table are derived from the responses of the eldercare recipients. The sum of the five categories is greater than 100 because most of the elderly have multiple caregivers.

Source: The 2006 Chinese Aged Population Survey (China Research Center on Ageing 2006).

caring for family members placed the caregiver at risk for losing earnings or being dismissed from the job altogether. Indeed, during the public-sector restructuring the government launched in 1997 as a means to revitalize ailing state-owned enterprises (SOEs), women, especially married women, bore a disproportionate share of layoffs and experienced considerable difficulty re-entering the labor market (Simon Appleton, John Knight, Lina Song, and Qingjie Xia 2002; Fenglian Du and Xiao-yuan Dong 2009a; Sai Ding, Xiao-yuan Dong, and Shi Li 2009). Furthermore, the post-restructuring social welfare program directly links all individuals' entitlements to social security, such as unemployment support, healthcare insurance, and pensions, to their labor market outcomes, which exacerbates the adverse financial consequences of caregiving for those who have to forego earnings or employment to look after their children, frail parents, and disabled family members.[11]

The welfare and labor market reforms have occurred alongside the government's decision to place growing stress on China's Confucian cultural heritage, emphasizing the notion of reliance on the family for welfare services (Gordon White 1998). For instance, in 1996 the Chinese government enacted the Elderly Rights and Security Law, which stipulates that care for frail elderly parents is a nonevadable responsibility of adult children. While promoting the Confucian ethic of filial piety may offer a way to free government from spending fiscal resources on eldercare provision, it is likely to reinforce the traditional familial gender norms. Indeed, John R. Logan, Fuqin Bian, and Yanjie Bian (1998) show that the patterns of co-residence of parents with adult children in post-reform urban China were consistent with patrilocal traditions, as married couples were found to be more likely to live with the husband's parents than with the wife's parents. The prevailing familial gender norms may affect how married women allocate time between paid work and unpaid care responsibilities.

EMPIRICAL METHODOLOGY

We examine the impact of parental care on married women's employment and supply of labor hours in urban China using multivariate regression analysis. Following the empirical studies on eldercare and women's labor supply for developed countries in the West that we reviewed in the introduction, we extend the standard model of labor supply determination to include the role of informal parental care. We explore the differences between caring for parents and caring for parents-in-law to take into account the influence of patrilineal familial norms. We hypothesize that, all else being equal, caring for parents has a smaller negative effect on the caregiver's labor supply than does caring for parents-in-law.

As a reflection of patrilineal norms, we expected married Chinese women in our sample to care for parents-in-law in exchange for their husbands'

approval and support and therefore we expected the attitudes of husbands to sway wives' decisions regarding time allocation. The pressure to participate in paid work is likely to be greater for those caring for parents than those caring for parents-in-law, given that their husbands would arguably be more supportive if their wives decided to forego employment or cut paid work hours in order to care for parents-in-law than if they did so to care for their own parents.

Let *Care* stand for informal caregiving, *Hours* for labor hour supply, and *LFP* for a binary measure of employment that is equal to 1 if *Hours* is greater than 0 and 0 if *Hours* is equal to 1. The variable *Care* is a categorical variable that differentiates care patterns by the identity of care recipients – parents or parents-in-law.[12] We specified the labor force participation and labor hour supply of a married woman as a function of *Care* and a vector of covariate control variables, *X*:

$$LFP = \alpha_1 Care + X\beta_1 + u_1 \quad (1)$$

$$Hours = \alpha_2 Care + X\beta_2 + u_2 \quad (2)$$

where the Greek letters are unknown parameters and u_i, $i=1, 2$ are the error terms. The structural parameters of α_1 and α_2 are the primary interest of the present empirical investigation. The variables in X are common determinants of the labor supply, such as education and age (and its squared term) of a woman and her husband, the age distribution of their children, unearned income, local average wages for paid caregivers and female and male workers, and time and provincial dummy variables.

A major empirical issue with this model is the potential endogeneity of caregiving. Ettner (1995, 1996) argues that informal care can be viewed as exogenously determined under three assumptions. These assumptions are: the allocation of care responsibilities among family members is independent of the employment status of the children; the family does not allow the needs of parents with disabilities to remain unmet; and substitutes to familial care are unavailable. She contends that these assumptions are unrealistic for the decision process of informal caregivers with regard to caring responsibilities and labor supply in developed countries like the US, where economic development has substantially eroded the traditional norm of familial care and institutionalized care services are widely available as substitutes for familial care. The violation of any one of the three assumptions would lead to an overestimation of the negative effect of caregiving on labor supply. Hence, Ettner (1995, 1996) and Wolf and Soldo (1994) carried out adjustments for the potential endogeneity of caregiving in their investigation.

The justifications for treating informal caregiving as an exogenous variable are arguably not as implausible in the case of China as they are for

developed countries in the West, given the powerful influence of the Confucian ethic of filial piety and the underdevelopment of institutionalized care services in this country. Nevertheless, the emergence of private care markets does allow high-earning women to use paid care services to meet their needs for eldercare. Moreover, women who have difficulty finding employment may take on more informal care in exchange for financial supports from relatives (Heying Jenny Zhan 2002). In the following analysis, we take into account both possibilities concerning the endogeneity of informal care and test for the presence of simultaneity bias.

We first assume that caregiving is exogenously determined and estimate equations (1) and (2) as an ordinary probit model and a tobit model, respectively. We then relax this assumption and estimate the two labor supply equations by the two-stage instrumental variables procedure laid out by Ettner (1995). Following Ettner's identification strategy, the instrumental variables (IVs) for *Care* include proxy variables for the care needs of parents and parents-in-law and the availability of other family members to share caregiving responsibilities. These variables are valid IVs given that they influence the behavior of caregiving but have no direct effect on labor force participation and labor hour supply after controlling for *Care* and other covariates. We first estimate a multinomial logit equation for *Care* using all of the exogenous variables in the system as regressors. We then apply linear probability regression for each of the two caregiving categories using the predicted probabilities from the multinomial logit model as identifying instruments.[13] We then use the predicted probabilities from the linear regressions as instruments for the variable *Care* in equations (1) and (2), which we estimated as a two-stage probit model and a two-stage tobit model, respectively. The two-stage IV estimates of the structural caregiving effects are consistent, but they are inefficient if caregiving is exogenously determined. Hence, we test the endogeneity of informal caregiving using the Hausman test procedure.

Data

The dataset used in this study is derived from the *China Health and Nutrition Survey* (CHNS), which was carried out for the years 1989, 1991, 1993, 1997, 2000, 2004, and 2006 (The Carolina Population Center at the University of North Carolina at Chapel Hill and the National Institute of Nutrition and Food Safety at the Chinese Center for Disease Control and Prevention 2007). Each survey covers about 3,800 households and 14,000 individuals in both urban and rural areas from nine provinces: Heilongjiang, Liaoning, Shandong, Henan, Jiangsu, Hubei, Hunan, Guizhou, and Guangxi. The survey provides rich socioeconomic information on individuals, households, and communities in the sample.

We use data on demographics, employment, and caregiving activities to analyze married women's time allocation to employment and care of elderly parents in the available years 1993–2006.[14] We restrict our analysis to married women in the age range 35–51 years who live in urban areas. Adult children aged 35 or older are more likely "at risk" for providing care to an elderly relative than those in the younger age group. We imposed the upper age limit due to the fact that we derived the variables for parental care needs and care patterns from the Survey of Ever-Married Women Under Age 52 – a supplementary survey of the CHNS; hence they are available only for those younger than 52. Although the data include a panel of individuals, we analyzed the data as repeated cross-sections to avoid biases related to attrition and cohort as the panel ages over time.[15] After omitting observations with missing information, we have a sample of 1,593 observations for analysis.

The Survey of Ever-Married Women under Age 52 asks the respondent the following questions: (1) Are your mother, father, mother-in-law, and father-in-law alive? (2) Does each of the four parents need to be cared for? (3) Have you helped each of the four parents in daily life and shopping during the past week? Based on the responses to question (3), we defined the variable *Care* as equal to 0 if the woman does not give care, 1 if the woman takes care of one or both of her own parents only, 2 if the woman takes care of one or both of her parents-in-law only, and 3 if the woman takes care of at least one parent and one parent-in-law. Because the number of observations in the last category is too small to identify the parameters of the multinomial logit caring equation, we combined categories 2 and 3 into one group, which we refer to as "caring for parents-in-law" in the remainder of the paper. This treatment is justified by the finding from the ordinary probit and tobit estimates that the effects of the two types of caregiving are fairly similar.[16] We derived four dummy variables from question (2) to measure the care needs of each of the four parents, and from question (1), we derived another four dummy variables for the survival status of each parent. The latter variables provide information on whether any parent may share the caregiving responsibility with the daughter or the daughter-in-law. The two sets of dummy variables for parental care needs and family caregiving resources serve as instruments for the *Care* variables in equations (1) and (2).[17]

Labor hour supply is measured by two variables: the average number of hours spent on paid work in a week and the total number of paid work hours in a year.[18] The binary indicator for employment is defined as equal to 1 if the total number of hours on paid work in the last year is greater than 0, and 0 otherwise. Most measures for the exogenous variables in X are straightforward. We measured education by years of schooling. We described the age distribution of children using counts of co-residing children in each of three age categories: 0–5, 6–12, and 13–18. Nonearned

income is a sum of husband's wage, subsidies, rental payments for household assets, welfare funds, and cash income received from other relatives. The variables of local paid caregivers' wages, men's wages, and women's wages, measured as *yuan* per year, are obtained from the database for local communities. Women's and men's wages are introduced to control for local labor market conditions. We discounted the variables of unearned income, caregivers' wages, and men's and women's wages by the consumer price index at the provincial level with 1993 as the base year. Finally, the price index is obtained from the *China Statistical Yearbooks* 1994–2007 (National Bureau of Statistics of China 2008: 17). Appendix Table A presents the descriptive statistics of the exogenous variables by caregiver status.

RESULTS

Table 2 presents mean values of work status and work hours by caregiver status for married women in our sample. Of the 1,593 observations, about 12 percent take care of at least one of the four parents, with 6.6 percent caring for parents and 5.8 percent for parents-in-law. Comparing columns (2) and (4) with column (1), we note a striking difference between caring for parents and for parents-in-law. Caregivers for parents have the same probability of working and a slightly higher number of work hours compared with noncaregivers. In contrast, caregivers for parents-in-law have a significantly lower probability of employment (by 15 percentage points) and a significantly smaller number of paid work hours (by 4 hours per week and 272 hours per year). The patterns of differences in employment and paid work hours between the two types of caregiving are consistent with the conjecture that caring for parents has a smaller negative effect on paid work than caring for parents-in-law, which is a reflection of patrilineal care norms.

Table 2 Employment and work hours of married women by caregiver status

	Non-caregivers	*Caregivers for own parents*	*(2)–(1)*	*Caregivers for in-laws or both*	*(4)–(1)*
	(1)	(2)	(3)	(4)	(5)
All women:					
Percent working	75.00	75.00	0.00	60.2	14.8***
Labor hours/week	33.07	33.92	0.85	28.74	-4.23**
Labor hours/year	1,544.76	1,588.00	43.24	1,272.43	-272.33**
No. observations	1,396.00	104.00	–	93.0	–
Percent observations	87.60	6.60	–	5.8	–

Notes: ***, ** and * denote significance levels of 1, 5, and 10 percent, respectively, for the difference in mean values for caregivers and noncaregivers.
Source: CHNS (1993–2006).

Table 3 presents average values of time used for various unpaid and paid activities during the week preceding the survey by caregiver status. For both employed and nonemployed women combined, there is no appreciable difference in housework and childcare between the two types of caregivers and noncaregivers. However, caregivers for parents spent 5.80 extra hours per week on eldercare and 2.88 hours fewer doing paid work than did noncaregivers, whereas the comparative figures for caregivers for parents-in-law are 6.33 more hours for eldercare and 6.28 hours fewer for paid work. Overall, caregivers spent 1–2 hours more on paid and unpaid work combined per week than noncaregivers, but the differences are statistically insignificant. Turning to employed women, we find that compared to the noncaregivers, both types of caregivers spent about 5–6 hours extra per week on eldercare and slightly fewer hours on housework, and they spent more hours on childcare and more hours on paid work. Consequently, the caregivers had less time for leisure by about 5 hours each week than the noncaregivers.[19]

Prior to discussing the estimates of effects of care on the labor supply, we take a look at the multinomial logit estimates of the reduced-form caregiving equation presented in Table 4. Looking at the estimates in that

Table 3 Time allocation of married women by caregiver status (hours per week)

	Non-caregivers	*Caregivers for own parents*	*(2)–(1)*	*Caregivers for in-laws or both*	*(4)–(1)*
	(1)	(2)	(3)	(4)	(5)
All women:					
Housework	17.56	16.59	-0.97	17.91	0.34
Childcare	0.08	0.47	0.39*	0.00	-0.08
Eldercare	0.00	5.80	5.80***	6.33	6.33***
Wage labor	29.79	26.91	-2.88	23.52	-6.28***
Total	47.43	49.77	2.34	47.75	0.32
No. observations	1259.00	79.00	–	64.00	–
Percent observations	89.80	5.63	–	4.57	–
For those participating in paid work:					
Housework	15.99	14.56	-1.45	14.21	-1.78
Childcare	0.003	0.42	0.42***	0.00	-0.003
Eldercare	0.00	6.16	6.16***	4.66	4.66***
Wage labor	42.05	42.52	0.47	44.26	2.22
Total	58.04	63.64	5.60***	63.14	5.10**
No. observations	892	50	–	34	–
Percent observations	91.39	5.12	–	3.49	–

Notes: Information presented in this table is for the activities undertaken during the week preceding the period in which the survey was carried out. Hence, wage hours in this table are different from weekly work hours reported in Table 2. ***, ** and * denote significance levels of 1, 5, and 10 percent, respectively, for the difference in mean values between caregivers and noncaregivers.
Source: CHNS (1993–2006).

Table 4 Multinomial logit regression estimates of care determination

Dependent variable	*Care for parents*		*Care for parents in-law*	
Explanatory variable	*Marginal effect*	*Standard error*	*Marginal effect*	*Standard error*
Mother needs care	0.219	0.061***	-0.001	0.004
Father needs care	0.144	0.066**	-0.003	0.003
Mother-in-law needs care	-0.011	0.014	0.065	0.024***
Father-in-law needs care	0.006	0.023	0.041	0.023*
Mother alive	-0.002	0.012	-0.001	0.003
Father alive	0.004	0.012	0.001	0.003
Mother-in-law alive	-0.026	0.011**	0.009	0.004**
Father-in-law alive	-0.012	0.010	-0.006	0.003**
Children 0–5	-0.021	0.017	-0.022	0.006***
Children 6–12	-0.012	0.013	-0.004	0.003
Children 13–18	-0.017	0.010*	-0.003	0.003
Education	0.001	0.002	0.000	0.001
Age	-0.001	0.019	0.004	0.007
Age^2	0.000	0.000	0.000	0.000
Education (husband)	-0.001	0.002	0.000	0.000
Age (husband)	0.013	0.015	0.000	0.004
Age^2 (husband)	0.000	0.000	0.000	0.000
Non-earned income	0.000	0.000	0.000	0.000
Local paid caregiver's wage	0.000	0.000	0.000	0.000
Local female wage	0.000	0.000	0.000	0.000
Local male wage	0.000	0.000	0.000	0.000
1997	0.018	0.021	0.005	0.006
2000	0.000	0.014	0.004	0.006
2004	0.012	0.018	0.012	0.008
2006	0.013	0.018	0.011	0.008
Provincial dummies	Yes		yes	
No. observations	1,593			

Notes: Multilogit estimates of marginal effects are presented with standard errors corrected for heteroscedasticity as well as for clustering by individuals. ***, **, and * denote significance levels of 1, 5, and 10 percent, respectively.
Source: CHNS (1993–2006).

table, we note that most of the variables for elderly care needs and survival status are statistically significant, indicating that these variables are correlated with the variable *Care* and therefore meet one of the two crucial IV requirements. The multinomial logit estimates provide insights into the care patterns. We note that the needs of parents have a stronger positive effect on the probability of care being provided than the needs of parents-in-law (0.219 and 0.144, respectively, for the needs of mother and father versus 0.065 and 0.041 for the needs of mother-in-law and father-in-law). Moreover, while the survival status of mother or father has no effect on caregiving of either type, having a living mother-in-law reduces the probability of providing care for parents (by 2.6 percent) but increases

the probability of caring for parents-in-law (by 1.1 percent). This result suggests that patrilineal norms play a role in prioritizing care-provision responsibilities by adult children. In addition, having a living father-in-law has a small negative effect on both types of care (1.2 percent for care for parents and 0.6 percent for care for parents-in-law), but only the effect on care for the parents-in-law is statistically significant. Given that women commonly outlive their spouses, the significant negative effect of having a living father-in-law indicates that the mother-in-law shares the caregiving responsibility with the adult children when the father-in-law is still alive.

Our findings of the gendered patterns of caregiving are consistent with the patterns of co-residence in urban China unveiled by Logan, Bian, and Bian (1998), who found that couples are more likely to live with the wife's parents if the wife has no brother and an adult child is more likely to live with a widowed mother than with married parents. The estimates of the variables for children also reveal the tensions between the competing demands of childcare and eldercare. Specifically, one additional child in the age groups of 0–5, 6–12, and 13–18 reduces a woman's probability of taking care of her parents by 2.1, 1.2, and 1.7 percent, respectively, although only the estimate for children aged 13–18 is statistically significant at the 10-percent level. For the case of caring for parents-in-law, all three estimates for children also have negative signs, but only the one for the youngest group is statistically significant at the 1-percent level. Numerically, the probability of taking care of parents-in-law falls by 2.2, 0.5, and 0.4 percent for one additional child in the age group of 0–5, 6–12, and 13–18, respectively.[20] In short, the estimates of the reduced-form caregiving equation show that the parental caregiving responsibilities of married women are determined primarily by the care needs of the elderly and children and the availability of informal caregiving resources.

Tables 5 and 6, respectively, present estimates of the employment status and labor hour supply equations for married women. In each table, we report both sets of estimates obtained under the alternative assumptions about the potential endogeneity of informal caregiving and the results of the Hausman test for this assumption. In Table 5, the first two columns present marginal effects and standard errors of the ordinary probit model, and the last two columns present the statistics of the two-stage IV probit model. As Table 5 shows, the two sets of coefficient estimates are fairly similar, although the standard errors of the two-stage IV estimates for caregiving variables are twice as large as those of the ordinary probit estimates. The Hausman test presented at the bottom of Table 5 cannot reject the null hypothesis that parental caregiving is exogenously determined at any conventional level of statistical significance.[21] For both models, caring for parents has a small positive effect on the woman's employment rate, but the effect is statistically insignificant. In contrast, caring for parents-in-law has a statistically significant negative effect on a

Table 5 Regression estimates of married women's employment rate

	Probit		*Probit (2SLS)*	
	Marginal effect	*Standard. error*	*Marginal effect*	*Standard error*
Care for parents	0.016	0.058	0.032	0.136
Care for parents-in- law or both	-0.115	0.063**	-0.098	0.118
Education	0.024	0.005***	0.024	0.005***
Age	0.101	0.067	0.100	0.067
Age^2	-0.001	0.001*	-0.001	0.001*
Education (husband)	0.013	0.005***	0.013	0.005***
Age (husband)	0.034	0.043	0.035	0.043
Age^2 (husband)	0.000	0.000	0.000	0.000
Non-earned income	0.000	0.000	0.000	0.000
Children 0–5	-0.107	0.100	-0.105	0.100
Children 6–12	0.026	0.045	0.026	0.045
Children 13–18	-0.012	0.033	-0.012	0.033
Local paid caregiver's wage	0.000	0.000	0.000	0.000
Local female wage	0.000	0.000	0.000	0.000
Local male wage	0.000	0.000	0.000	0.000
1997	-0.070	0.049	-0.072	0.049
2000	-0.124	0.050***	-0.126	0.050***
2004	-0.243	0.054***	-0.244	0.054***
2006	-0.247	0.053***	-0.249	0.054***
Hausman test: χ^2 (p value)	0.02 (0.99)			
Wald test for zero slopes (p value)	169.18 (0.0)	165.96 (0.0)		
Pseudo R^2	0.155	0.153		
No. observations	1,593	1,593		

Notes: Standard errors are corrected for heteroscedasticity and also for clustering by individuals. ***, **, and * denote significance levels of 1, 5, and 10 percent, respectively. All equations include an intercept and provincial dummy variables.

Source: CHNS (1993–2006).

woman's probability of working, reducing the probability by 11.5 percent for the probit model and 9.8 percent for the IV probit model. These results show that women who care for parents-in-law are more likely to withdraw from paid work than those who care for parents, all else being equal.

Turning to the covariates that are statistically significant, we note that women with greater educational attainment and/or those who are married to better-educated husbands have higher rates of employment, with the respective estimates of 2.4 and 1.3 percent for one additional year of schooling. The time dummies reveal sharp declines in women's employment rates (by more than 24 percent between 1993 and 2006), consistent with the rising unemployment rate and the declining labor force participation rate among married women observed during the post-restructuring period in urban China.

Table 6 Tobit estimates of married women's labor hour supply

Dependent variable	*Labor hours per week*		*Labor hours per year*	
	Tobit	*Tobit (2SLS)*	*Tobit*	*Tobit (2SLS)*
Explanatory variable	*Marginal effect*	*Marginal effect*	*Marginal effect*	*Marginal effect*
Care for parents	1.425 (1.953)	-0.564 (4.491)	70.167 (92.248)	-33.020 (211.84)
Care for parents-in-law or both	-3.852 (1.865)**	-6.433 (4.446)	-228.064 (85.561)***	-366.227 (209.880)*
Education	0.838 (0.168)***	0.839 (0.168)***	37.856 (7.914)***	37.906 (7.933)***
Age	4.561 (2.328)**	4.608 (2.334)**	204.078 (109.770)*	206.788 (110.050)*
Age^2	-0.060 (0.027)**	-0.061 (0.027)**	-2.675 (1.263)**	-2.706 (1.266)**
Education (husband)	0.390 (0.177)**	0.381 (0.178)**	21.580 (8.349)***	21.134 (8.387)**
Age (husband)	2.306 (1.471)	2.356 (1.477)	93.685 (69.302)	96.109 (69.629)
Age^2 (husband)	-0.024 (0.016)	-0.024 (0.016)	-0.969 (0.738)	-0.999 (0.741)
Non-earned income	0.0000 (0.0001)	0.000 (0.000)	0.000 (0.003)	0.000 (0.003)
Children 0–5	-5.125 (2.760)*	-5.270 (2.754)*	-237.888 (130.210)*	-245.431 (129.920)*
Children 6–12	0.352 (1.549)	0.265 (1.554)	8.192 (72.847)	3.702 (73.060)
Children 13–18	-0.946 (1.123)	-1.058 (1.132)	-41.499 (52.964)	-47.434 (53.408)
Local paid caregiver's wage	0.0003 (0.0002)	0.000 (0.000)	0.014 (0.008)*	0.014 (0.008)*
Local female wage	0.0004 (0.0005)	0.000 (0.001)	0.022 (0.025)	0.023 (0.025)
Local male wage	-0.0007 (0.0005)	-0.001 (0.000)*	-0.039 (0.022)*	-0.040 (0.022)*
1997	-3.991 (1.612)**	-3.921 (1.618)**	-183.246 (76.014)**	-179.474 (76.339)**
2000	-4.641 (1.557)***	-4.607 (1.559)***	-221.409 (73.254)***	-219.492 (73.374)***
2004	-8.020 (1.524)***	-7.899 (1.535)***	-405.410 (71.096)***	-399.094 (71.646)***
2006	-8.170 (1.518)***	-8.053 (1.529)***	-413.439 (70.806)***	-407.322 (71.328)***
Wald test for zero slopes (p value)	255.81 (0.0)	240.05 (0.0)	243.23 (0.0)	247.14 (0.0)
Hausman test: F statistic p value	0.27 0.76		0.33 0.72	
No. observations	1,593	1,593	1,593	1,593

Notes: Figures presented in parentheses are standard errors. ***, **, and * denote significance levels of 1, 5, and 10 percent, respectively. All equations also include an intercept and provincial dummy variables.
Source: CHNS (1993–2006).

In Table 6, the first two columns summarize the results of the two types of tobit estimates for weekly paid work hours, and the last two present the results for annual paid work hours. As with the probit equations, the Hausman test cannot reject the null hypothesis that parental caregiving is exogenous to the labor supply decision for either labor hour measure. Once again, the estimates show that caring for parents has no statistically significant effect on work hours in all four cases, whereas the effect of caring for parents-in-law is consistently negative and significant. Numerically, taking care of parents-in-law reduces the number of paid work hours by 3.8 to 6.4 hours per week and 228 to 366 hours per year. The sign patterns and statistical significance of education of the woman and her spouse and the woman's age are similar to the probit estimates presented in Table 5. While having young children (age 0–5) has no statistically significant effect on a woman's employment status, it substantially reduces the number of paid work hours, by about 5 hours per week and 237 to 245 hours per year. It is evident that married women's labor supply has been adversely affected by their caregiving responsibilities for family members at different stages of the life span. Consistent with the probit estimates, the year dummy variables show substantial decreases in work hours of married women in the post-restructuring period.

CONCLUSIONS

China's transition from a centrally planned economy to a market one has led to a sharp decline in government and employer support for care provision and a fundamental shift of responsibility to the family, where women bear the majority share. The rapid growth of the aging population has compounded the burdens of eldercare shouldered by Chinese women. In this study, we examine the impact of parental care on married women's employment and labor hour supply in urban China using the *China Health and Nutrition Survey* for the period from 1993 to 2006. Our estimates show that Chinese women confront competing demands for care, not only from elderly parents and parents-in-law but also between these older parents and their own young children. Moreover, our estimates unveil striking differences in labor market outcomes between caring for parents and caring for parents-in-law: caring for parents does not affect the caregiver's employment status and work hours, whereas caring for parents-in-law has a statistically significant, sizable negative effect on the caregiver's probability of employment and hours of paid work. This finding indicates that traditional patrilineal norms still play a role in shaping intrahousehold allocation in urban China.

The findings of our analysis have important policy implications. The welfare reforms that cut back on government and employer support for

social reproduction and shift the responsibility predominantly to the family have adverse repercussions for women's emotional, physical, economic, and social well-being. Given women's role in social reproduction, the deterioration of women's economic, health, and social status has severe negative consequences for the well-being of children, the elderly, and families. At the Sixteenth Chinese Communist Party Congress in 2002, the Chinese government introduced a new human-centered development program (*yi-ren-wei-ben*) that aims to transform China into a harmonious, well-off society (*hexie, xiaokang*). As this study has demonstrated, the market-oriented welfare reforms are incompatible with the goal of promoting human-centered development and social harmony. To deal with the impending eldercare crisis, changes must be made to China's existing labor market and eldercare policies. Such changes would need to include greater recognition of unpaid care work within social security systems; increasing workplace services and support for caregivers; encouraging men to contribute more time to unpaid care work; and developing decent eldercare and childcare facilities and making them more accessible to low-income families.

Due to space limitations, our analysis focuses on informal care – the main source of care for the elderly population in China. In the post-reform period, private markets for eldercare have emerged in response to the growing demand, and migrant women and laid-off female workers account for the majority share of paid care workers. There has been a growing recognition of the role of market agencies in the provision of eldercare by Chinese researchers and policymakers. However, studies on established market economies show that because paid care workers are generally from disadvantaged socioeconomic groups, their pay tends to be low, their working conditions poor, and their own needs for care are often neglected (Razavi 2007). To develop gender-sensitive eldercare public policy, the challenges faced by Chinese paid care workers warrant attention from researchers and policymakers.

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ACKNOWLEDGMENTS

We are grateful for the comments and suggestions of the guest editors, style editor, three anonymous referees, and participants in the workshop for the special issue of *Feminist Economics* on "Unpaid Work, Time Use, and Public Policy" at American University. We also thank the Heinrich Böll Foundation Beijing Office for its financial support for the project "Care for Children and Elders and Its Impact on Women in China" and the Ford Foundation for its support for the Economic Research and Training Program for young Chinese women economists.

NOTES

[1] See Patrick Hennessy (1996) and Stephane Jacobzone (1999) for an overview of policy responses to the growing care needs of frail elderly people in Organisation for Economic Co-operation and Development (OECD) countries.

[2] In this contribution, we consider only married women with male partners due to the data limitation. We confine our analysis to the urban sector because the labor market and social security system are distinctively different between the urban and the rural sectors in China.

[3] Defining the aged dependency ratio as persons age 60 or older divided by persons between age 15 and 59, Dudley L. Poston, Jr., and Chengrong Charles Duan (2000) project that China's aged dependency ratio will increase from 15.7 percent in 1999 to 26.1 percent in 2020 and 58.6 percent in 2050. In comparison, according to this paper, the aged dependency ratio of the United States was 26.6 percent in 1999 and is projected to be 46.3 percent in 2050.

[4] According to China's Second National Survey on Disability in 2006, 44.2 million disabled people are over 60 years old, which is 23.65 million more than the figure in 1987 based on the First National Survey on Disability, and they account for 75.5 percent of the increased disabled population (Office of the Second China National Sample Survey on Disability 2007: 11).

[5] The recent surge of interest in the economics of aging has sparked a growing literature on old age security and eldercare in China. However, the majority of past research efforts have been restricted to exploring the implications of economic reforms and development for the well-being of eldercare receivers, paying little attention to how care burdens have affected women with frail parents in China. A selective list of studies on the economic transition and well-being of elderly people in China includes Yean-Ju Lee and Zhenyu Xiao (1998), Alun E. Joseph and David Philips (1999), Dwayne Benjamin, Loren Brandt, and Scott Rozelle (2000), and Ge Lin (2002).

[6] By definition, "patrilineality" refers to a system that pertains to, or organizes kinship with and descent through the father or the male line (John A. Simpson and Edmund S. C. Weiner 1989: 348). In this paper, the term "patrilineal familial care" is used to describe the social norm that married women are expected to care for parents-in-law in exchange for their husbands' approval and support. In a patrilineal system where sons are entitled to inherit property, sons and their wives (not daughters) are obligated to look after their parents. While China's Constitution gives sons and daughters equal rights to inherit family property, the law has not been effectively enforced, and hence, strong pro-son bias exists in practice, even in the cities. For instance, in the early 1980s, the Chinese government allowed the youth who had been sent down to the countryside during the Cultural Revolution and later returned to the

cities to replace their parents in the workforce in order to reduce urban unemployment. Most parents (both fathers and mothers) who retired from the labor force in response to this policy passed the employment opportunity to their sons, not daughters. Hence, while being weakened, patrilineal norms continue to exert influence on the pattern of informal care for the elderly.

[7] The stipulation of family responsibility for the elderly of the Constitution and the Marriage Law is still in effect.

[8] The authors calculated the statistics. The Chinese Aged Population Survey was conducted by the China Research Center on Aging in 2006. The survey covers 19,947 respondents, with 10,016 in urban areas and 9,931 in rural areas.

[9] For instance, the 2006 Chinese Aged Population Survey shows that about 57 and 38 percent of the disabled elderly received care from daughter and daughters-in-law, respectively; the respective percentages for sons and sons-in-law were 40 and 27 percent (see Table 1; China Research Center on Aging 2006). These figures are derived based on the responses of elderly care recipients. Given the gendered norms and expectations for caregiving, the extent of eldercare provided by daughters and daughters-in-law is likely to be understated, while the opposite is true for sons and sons-in-law.

[10] See Jianhua He and Yongping Jiang (2008), Liu, Zhang, and Li (2008), and Fenglian Du and Xiao-yuan Dong (2009b)for reference on the impact of welfare reforms on childcare, eldercare and healthcare in China, and Kate Bezanson and Meg Luxton (2006) for the welfare reform and its gender implications in Canada.

[11] For instance, pension reform in China has spread financial and administrative burdens from state enterprises to a broad swath of employers, workers, national agencies, and local governments (Gang Fan, Maria Rosa Lunati, and David O'Connor 1998). The essence of pension reform is to replace retirement benefits provided by state enterprises with benefits linked to the amount that an individual worker contributes to a retirement account while employed. The idea is to build up individually funded accounts along with social pools that can provide a minimum pension benefit. Payments to both social pools and individual accounts are to derive from employees as wage deductions and from employers.

[12] The limitation of the categorical measure for care is noteworthy. The impact of eldercare on labor supply depends upon the nature and intensity of caregiving. According to the China Health and Nutrition Survey (CHNS), the two types of caregivers, on average, spent more or less the same number of hours on eldercare (see Table 4). Regrettably, the survey provides no information on the nature of each type of caregiving.

[13] The procedure only consists of linear probability regressions for *Care* and IV estimation of equations (1) and (2) yields consistent but inefficient estimates of the structural parameters (James J. Heckman 1978). To acquire efficient estimates, the multinomial logit regressions are introduced. Ettner (1995) calls estimates of the multinomial logit model "stage-zero" estimates, and estimates of the linear probability model "stage-one" estimates.

[14] The main source of parental care information – the Survey of Ever-Married Women Under Age 52 – is unavailable for 1989 and 1991.

[15] We adjust the standard errors of estimates for heteroscedasticity and also for clustering by cross-sectional units.

[16] The regression results are available upon request to the authors.

[17] Ettner (1995, 1996) and Wolf and Soldo (1994) use parents' health status to measure the parents' demand for caregiving and number of siblings for the availability of other family members to share caregiving responsibilities. Information on the health status of parents is unavailable in the CHNS, and information on siblings is unavailable for

the 1993 and 1997 surveys. One limitation of using parents' survival status as IVs for *Care* is its potential correlation with a woman's labor supply. Arguably, women whose parents are still alive may need to work longer hours to support their parents. To check whether such a correlation exists, we added the four parental survival indicators to the labor force participation and labor supply equations. None of these variables were found to have any significant, appreciable impact on the labor supply variables. This result is not surprising; with patrilineal social norms, it is sons, not daughters, who are expected to provide financial support for older parents.

[18] The CHNS also provides information on the number of hours worked during the week preceding the survey. We choose the measures based on labor supply in a typical week, which better capture long-run accommodations to care responsibilities, as Wolf and Soldo (1994) argue. As a sensitivity check, we estimate the structural effects of caregiving using the number of hours worked in the last week, and the estimates obtained are qualitatively similar to those presented in Tables 5 and 6.

[19] One should read the comparative statistics between caregiving types with caution, since the number of observations is small.

[20] Studies of other developing countries show that school-aged children, especially girls, help reduce their mothers' care burdens by taking care of younger siblings (for example, see Rachel Connelly, Deborah S. DeGraff, and Deborah Levison 1996). However, this may not be the case in urban China given the extraordinary attention Chinese parents pay to their children's test performance at each level of school entry examinations.

[21] Based on the Hausman test, the assumption that caregiving is determined by care needs and availability of care resources and not by employment status seems plausible for the part of urban China under investigation. Reliable paid care services for the disabled elderly are available mainly in large cities such as Beijing, Tianjin, Shanghai, and Guangdong. These cities are not covered by the CHNS survey, and these services are also too expensive for a typical family in our sample. The finding that caring for parents-in-law has a significant impact on the caregiver's labor supply while caring for parents has no such effect also casts doubt on the view that women take on more informal care because they are unable to find employment. There is no reason to believe that daughters-in-law have more difficulty finding re-employment than daughters.

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APPENDIX

Appendix Table A Mean values of the exogenous variables by caregiver status

	Non-care provider	Care for parents	Care for parents in-law or both
Number of observations	1,396	104	93
Percent observations	87.63	6.53	5.84
Mother needs care	0.07	0.46	0.11
Father needs care	0.05	0.34	0.09
Mother in-law needs care	0.06	0.08	0.47
Father in-law needs care	0.04	0.07	0.22
Mother alive	0.64	0.80	0.65
Father alive	0.46	0.63	0.51
Mother in-law alive	0.60	0.63	0.51
Father in-law alive	0.43	0.39	0.40
Children aged 0–5	0.03	0.01	0.00
Children aged 6–12	0.22	0.17	0.13
Children aged 13–18	0.46	0.17	0.13
Education (year)	9.08	9.10	9.03
Age	42.63	43.61	42.88
Husband's education (year)	10.08	9.79	9.86
Husband's age	44.69	45.34	44.48
Nonearned income (yuan/year)	6,660.32	8,431.73	7,837.81
Local paid caregiver's wage (yuan/year)	1,969.45	2,508.26	2,165.42
Local male wage (yuan/year)	3,666.41	3,948.76	4,162.91
Local female wage (yuan/year)	2,931.57	3,166.58	3,385.93

Notes: Earnings are discounted by consumer price index at the provincial level with 1990 as the base.
Source: CHNS (1993–2006).